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GRAY SQUIRREL,
(*Sciurus carolinensis*).
♂ Life-size.

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Natural History

EMBRACING

Living Animals of the World
and Living Races of Mankind

EDITORS AND SPECIAL CONTRIBUTORS:

Charles J. Cornish, F. C. Selous, Ernest Ingersoll, Sir Harry Johnston, K.C.B.,
Sir Herbert Maxwell, F.R.S., H. N. Hutchinson, F.R.G.S.,
J. W. Gregory, F.G.S., R. Lydekker, F.R.S.,
F.Z.S., and many other eminent
naturalists

Nearly Two Thousand Illustrations



Vol. I

MAMMALS

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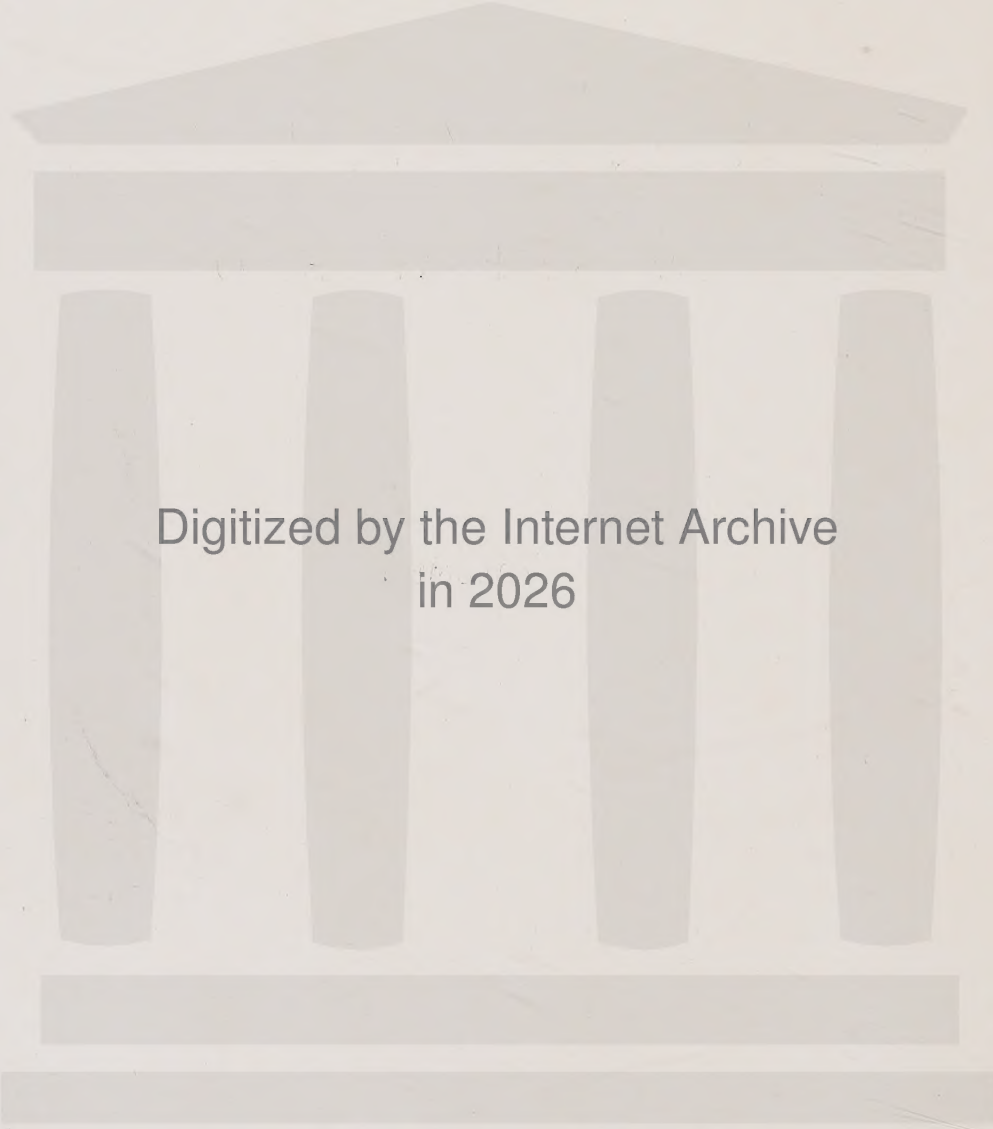
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LIVING ANIMALS
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PEKIN DEER IN SUMMER DRESS

Woburn

An example of the white spotted type of coloration so common among herbivorous mammals

INTRODUCTION

THE interest now taken in Natural History is wide-spread and intelligent to a degree never known before, and any publication that purports to present the animal world in a new and clearer way is sure of a welcome, and as wide an acceptance as it deserves.

Nothing is more essential to the successful presentation of animal life and habits than good pictures. The universal interest of the public in zoological gardens, traveling menageries and museums, the educational value of which is more and more strongly recognised, arises not only from a natural curiosity, but also from the need of seeing the real creatures or their preserved embodiments, in order properly to understand and realise the descriptions of animals and



By permission of Herr Carl Hagenbeck

[Hamburg]

NEGRO BOY AND APES

An interesting picture of a Negro boy, with a young Chimpanzee (left side of figure) and young Orang-utan (right side of figure)

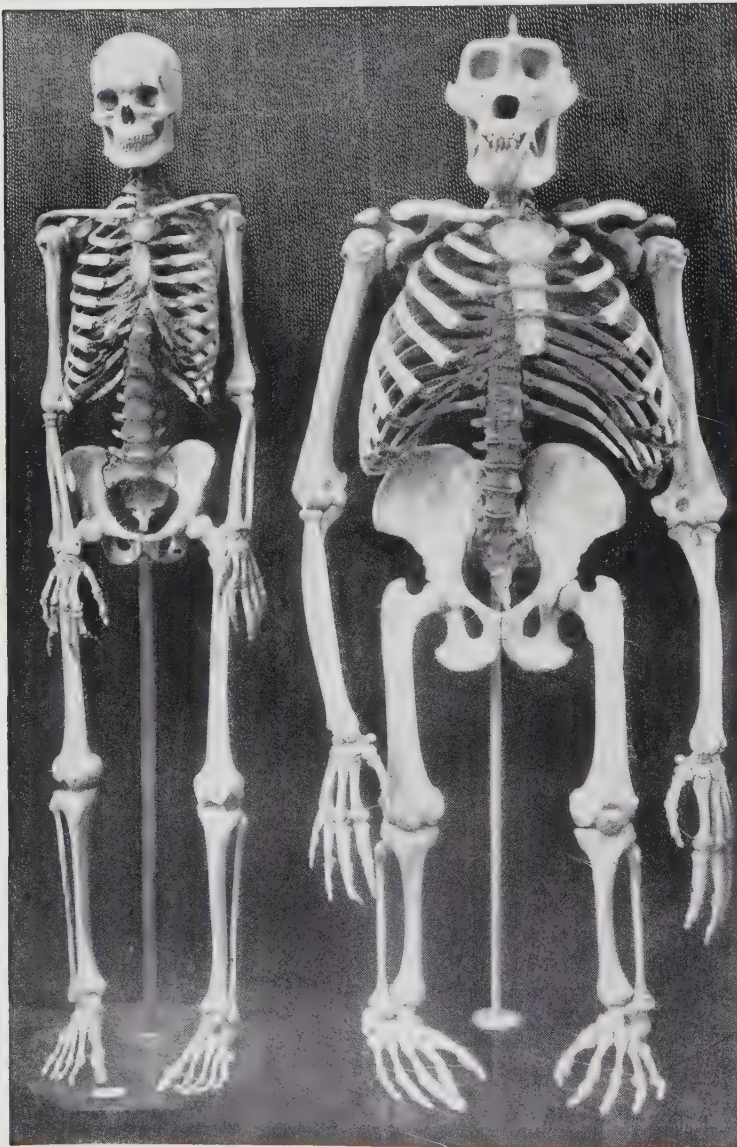
their ways with which books of exploration and travel, school treatises and current literature are nowadays crowded. Without such help, indeed, the study of zoology would be practically impossible, and therefore pictures have always been considered necessary to books of natural history. Too often, however, they have been sorry treatises upon the reality, reflecting the imaginations of the draughtsman rather than the truth of nature.

Photography was therefore welcomed by naturalists and scientific writers as a means of vastly needed improvement, yet only recently has it been possible to utilise it in any

important picturesque way in the illustration of living animals. For a long time the difficulties to be overcome baffled both photographers and naturalists. The makers of photographic instruments and materials were compelled to experiment for many years before they were able to perfect "quick" plates and lenses that would answer the purpose, and then it was only here and there that a man was able or willing, or had the opportunity to make use of the portable cameras, telephoto lenses, and other special apparatus required to obtain successful portraits of living creatures, especially those at liberty "on their native heath."

It must be remembered, too, that the processes of mechanical engraving had to be perfected in order to reproduce such photographs so that they might be printed without the intervention of brush or graving-tool, with their chances of loss of correctness.

What would we not give



By permission of Herr Umlauff

[Hamburg]

SKELETONS OF MAN AND GORILLA

This photograph shows the remarkable similarity in the structure of the human frame (left) and that of the gorilla (right). This gorilla happened to be a particularly large specimen; the man was of ordinary height



Photo by G. Watnough Walker & Son

[Christie

SEA-SWALLOWS

From their long wings, forked tail, and flight, the Terns are popularly called Sea-swallows



Photo by Ottomar Anschütz

[Berlin]

AFRICAN LEOPARD

An example of the black-spotted type of coloration so prevalent in Carnivora

women have overcome the obstacles, and partly by great patience and skill, and partly by seizing happy chances, have captured and preserved for us the portraits of a host of animals of every sort. It is these which have now been gathered to illustrate, in a comprehensive and original manner this new general history of the Living Animals of the World, — mammals, birds, reptiles, fishes, and lowly life of land and sea.

It is no disparagement of its often excellent predecessors to say that in its illustrations, at least, this work surpasses anything that has gone before it, since no previous publication could have presented its pictorial contents. The materials, in respect to both pictures and written text, have been gathered from the whole world,

had the pioneers of America or Africa been able to take with them cameras, and, instead of taking advantage of the tameness of the game unused to the hunter, which enabled them to kill it, sometimes, with clubs, had gathered for us easily the portraits of many an animal, perhaps in flocks and herds, which have now disappeared! It is one of the most important functions of out-door photography, to-day, to preserve for posterity a record of passing conditions and of diminishing species; and a work like the present is of permanent interest, and will increase in historical and bibliographical value as time goes on.

One by one in various parts of the world within the last half a dozen years, ingenious, energetic, and capable men and



EAST AFRICAN GIRAFFE

This photograph was taken in the wilds of Africa by Lord Delamere, and shows the animal at home. The tree is a mimosa, on the top shoots of which the giraffe habitually feeds



Photo by W. Saville-Kent, F.Z.S.]

[Croydon

FLYING-FOX

This bat, which is a native of Australia (where it was photographed), is commonly called the Flying-fox. Great flocks set out at sunset from the forest to feed upon the indigenous fruits, such as that of the native fig

and represent the latest studies, much of which has never been before popularly published. Specialists of distinction and renowned scientific travelers have contributed photographs and field-notes, often from remote regions where alone many of the most rare and interesting animals may be found. These unique contributions come from the most distant islands of the Southern Ocean, the deserts and coral reefs of Australia, the New Zealand hills, the Indian jungle, the African forest and veldt, and the wilds of tropical and polar America. Such a collection as is here made of photographs and accounts of the domestic animals of the world would alone be a valuable and entertaining contribution to literature.

Another highly interesting feature is the large number of pictures given of the animals of various sorts trained by Carl Hagenbeck and others, shown in "happy

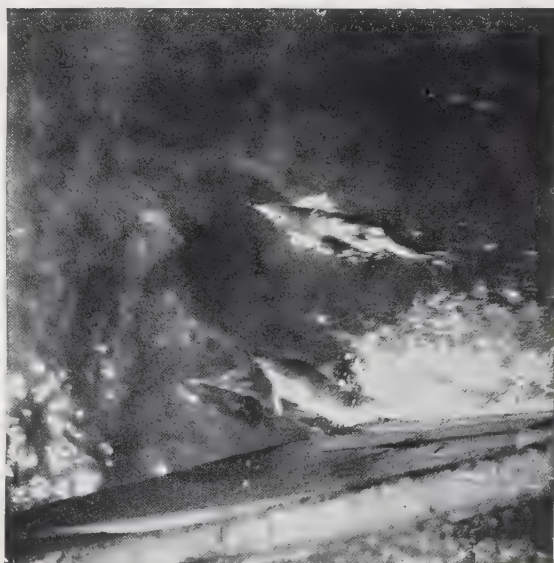


Photo by F. G. Afalo, F.Z.S.

DOLPHINS

This photograph was taken in mid-ocean, and shows a couple of dolphins following a ship across the Atlantic



Photo by Fratelli Alinari]

[Florence

A HAPPY FAMILY

Hyæna, tiger, and lions living in amity—a remarkable proof of their tamer's power. In the same park at Hamburg, belonging to Herr Hagenbeck, are also bears, dogs, leopards, and pumas, all loose together

sportsmen treat of other game animals of the Dark Continent. To Mr. W. Saville-Kent, author of "The Great Barrier Reef," has been assigned the Marsupials of Australia, and also the Reptiles generally. Sir Herbert W. Maxwell writes on the Salmon family, and so on; while Dr. Richard Lydekker, Dr. Bowdler Sharpe, Mr. F. W. Kirby, and other specialists are editorial advisers in regard to the branches in which they stand as authorities.

Wherever it has not been possible to get really good pictures of some shy wild creature in its native haunt, living examples have been sought in the great Zoological Gardens of the world—London, Berlin, Antwerp, Florence, New York, Calcutta, Sydney, etc.,—or in the parks of American men of wealth and European noblemen. These have been "posed" as nearly as possible in the surroundings natural to them, and faithful portraits have been obtained. Now and then it was desirable, in order to complete a family history, to include portraits of varieties which are not even known in captivity, and here the

family" groups, or in the performances of various feats; for this is material toward a better knowledge of the mental characteristics and powers of the brutes, which is a subject attractive to every thoughtful person, and upon which all the light is needed that can be gained.

The editor has had eminent assistance. Mr. F. C. Selous deals with the African Lion and the Elephants, with which he has had thrilling experiences; and other



ELEPHANTS

This is another of Lord Delamere's East African photographs, and shows a couple of wild elephants in the open

museums have been drawn upon and photographs of stuffed specimens and groups, naturally mounted, have been obtained; but these cases are not many, and though less interesting serve their purpose almost as well as the "living pictures" that predominate from end to end of this portrait-gallery of the animal life of the globe.

Such a book as this, covering in an entertaining style the whole range of zoology, carefully prepared by men of exact knowledge, yet avoiding technicalities, and wholly illustrated by precise reproductions of photographs, many of the full size of the quarto page and colored to life, is not only novel and beautiful, but of high value as an educator; and it would seem to be as indispensable a part of the library of every family and school-



By permission of the Hon. Walter Rothschild]

[Tring

GIANT TORTOISE

This photograph of Mr. Walter Rothschild riding on one of his huge tortoises gives a good idea of the relative sizes of one of the "giant tortoises" and a human being

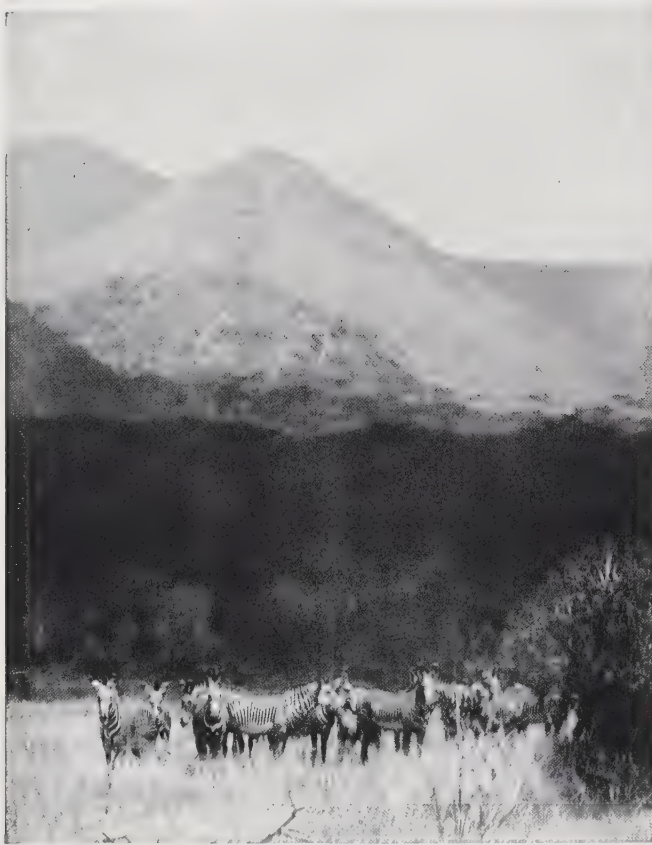


Photo by Fratelli Alinari]

[Florence

A GROUP OF CROCODILIANS

A wonder of modern animal-training. The photograph shows a number of living crocodilians with their trainer. They have been on exhibition in Florence for some years past, and are still to be seen there



SOMALI ZEBRAS

This is a photograph of a group of zebras taken in Africa, and gives some idea of the surrounding country, where they live in happy freedom

photographs; Dr. R. W. Shufeldt, of Washington, for many photographs of fish and other animals in their natural surroundings; Mr. W. Saville-Kent, F. Z. S., F. L. S., for the photographs taken by him while in Australia; Mr. Lewis Medland, F. Z. S., for the use of his singularly complete set of animal photographs; Herr Carl Hagenbeck, of Hamburg, for permission to use his photographs of some extremely rare specimens of animals which from time to time have found a temporary home at his wonderful Thierpark; the Trustees of the British Museum, for permission to photograph some of their animals; Professor E. Ray Lankester, Director of the Natural History Branch of the British Museum; and the Zoological Society, for permission to photograph some of the animals. And also to Herr Ottomar Anschütz, of Berlin; Messrs. Bond & Grover, of the Scholastic Photographic Co.; Signor Alinari, of Florence; Messrs. Kerry & Co. and Mr. Henry King, of Sydney; Mr. Charles Knight; Mr. J. W. McLellan; Messrs. Charles and William Reid; Messrs. A. S. Rudland & Sons; and Messrs. York & Sons, for permission to reproduce their photographs.

room as is a dictionary or year-book, since by its aid all reading may be illuminated, and perchance corrected, and the whole view of nature enlightened and enlarged.

ERNEST INGERSOLL.

The special thanks of the Editor and Publishers are due to a great many naturalists and zoologists for the valuable help they have given to, and the interest they have taken in, this work while it has been in preparation. No doubt, before the complete work is published, a great many more names will be added to the list, but meanwhile grateful acknowledgment should be made to the following:—Her Grace the Duchess of Bedford, who has kindly allowed many of her fine photographs to be reproduced in these pages; the Hon. Walter Rothschild, M. P., for the splendid collection of photographs taken especially for him in all parts of the world; Lord Delamere, for several unique photographs taken with a telephoto lens during his celebrated expedition to Africa; Major Nott, F. Z. S., for the use of his scientific series of animal



Photo by Dr. R. W. Shufeldt]

[Washington

SUN-FISH

This photograph was taken through the water by Dr. R. W. Shufeldt, who has made a speciality of this kind of photography



Photo by G. W. Wilson & Co., Ltd.]

Anger



A YOUNG CHIMPANZEE

Pleasure



[Aberdeen

Fear

The Living Animals of The World

BOOK I. MAMMALS

CHAPTER I

APES, MONKEYS, AND LEMURS

THE MAN-LIKE APES

THE CHIMPANZEE

OF all the great apes the CHIMPANZEE most closely approaches man in bodily structure and appearance, although in height it is less near the human standard than the gorilla, 5 feet being probably that of an adult male.

Several races of this ape are known, among them the TRUE CHIMPANZEE and the BALD CHIMPANZEE. The varieties also include the Kulo-kamba, described by Du Chaillu, and the Soko, discovered by Livingstone, who confounded it with the gorilla. But the variations in neither of these are sufficiently important to justify their being ranked as species.

The first authentic mention of the chimpanzee is found in "The Strange Adventures of Andrew Battell," an English sailor taken prisoner by the Portuguese in 1590, who lived eighteen years near Angola. He speaks of two apes, the Pongo and the Enjocko, of which the former is the gorilla, the latter the chimpanzee. The animal was first seen in Europe in 1641, and described scientifically fifty-eight years later, but we are indebted



Photo by Fratelli Alinari, Florence
ARABIAN BABOON



Photo by Scholastic Photo. Co.]

[Parson's Green

"JENNY," THE WELL-KNOWN CHIMPANZEE
A VERY CHARACTERISTIC POSE

In this picture the rounded ear, human-like wrinkles on the forehead, and length of the toes should be noted

to Dr. Savage, a missionary, for our first account of its habits, in 1847.

The chimpanzee, like the gorilla, is found only in Africa. The range includes West and Central Equatorial Africa, from the Gambia in the north to near Angola in the south, while it occurs in the Niam-Niam country to the northwest of the great lakes, and has been discovered recently in Uganda. The new Uganda Railway, which will open out the great lakes to the east, will bring many travelers well within reach of the nearest haunts of these great apes. It is on the likeness and difference of their form and shape to those of man that the attention of the world has been mainly fixed.

— The chimpanzee is a heavily built animal, with chest and arms of great power. The male is slightly taller than the female. The crown is depressed, the chin receding, the ridges which overhang the eye-sockets more prominent than in man, less so than in the gorilla. The nose has a short bridge, and a flat extremity. The

ear is large, and less human than that of the gorilla. The hands and feet are comparatively long; the digits are, except the thumb and great toe, joined by a web. The arms are short for an ape, reaching only to the knees. The teeth are similar to those of man, and the canines of only moderate size. The chimpanzee has thirteen pairs of ribs, and, like man, has a suggestion at the end of the vertebræ of a rudimentary tail. It walks on all-fours, with the backs of its closed fingers on the ground, and can only stand upright by clasping its hands above its head. The skin is of a reddish or brown flesh-colour, the hair black with white patches on the lower part of the face. The bald chimpanzee has the top, front, and sides of the face bare, exceedingly large ears, thick lips, and black or brown hands and feet.—

The chimpanzee's natural home is the thick forest, where tropical vegetation ensures almost total gloom. But near Loango it frequents the mountains near the coast. It is a fruit-feeding animal, said to do much damage to plantations, but the bald race, at all events in captivity, takes readily to flesh, and the famous "Sally" which lived in the Zoo for over six years used to kill and eat pigeons, and caught and killed rats. The male chimpanzee builds a nest in a tree for his family, and sleeps under its shelter; when food becomes scarce in the vicinity, a move is made, and a new nest built. This ape lives either in separate families or communities not exceeding ten in number, and is monogamous.

As to the animal's courage, it is difficult to get accurate information, as the sins of the



CHIMPANZEE.
1/2 Life-size.

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are much smaller, and the ridges above the eyes are not noticeable, a feature common also to the young.

Timid, superstitious natives and credulous or untrustworthy travelers have left still wrapped in mystery many of the habits of this mighty ape, whose fever-stricken, forest-clad haunts render investigation always difficult, often impossible. Many tales of its ferocity and strength are obviously untrue, but we think that too much has been disbelieved. That a huge arm descends from a tree, draws up and chokes the wayfarer, must be false, for intelligent natives have confessed to knowing no instance of the gorilla attacking man. That it vanquishes the leopard is probable; that it has driven the lion from its haunts requires proof. Nor can we accept tales of the carrying off of Negro women; and the defeat of the elephants, too, must be considered a fiction.

But we must believe that this ape, if provoked or wounded, is a terrible foe, capable of ripping open a man with one stroke of its paw, or of cracking the skull of a hunter as easily as a squirrel cracks a nut. There is a tale of a tribe that kept an enormous gorilla as executioner, which tore its victims to pieces, until an Englishman, doomed to meet it, noticing a large swelling near its ribs, killed it with a heavy blow or two on the weak spot.

Gorillas live mainly in the trees on whose fruit they subsist; they construct a shelter in the lower boughs for the family, and as a lying-in place for the female. The male is said to sleep below, with his back against the tree—a favourite attitude with both sexes—to keep off leopards. On the ground it moves on all-fours, with a curious swinging action, caused by putting its hands with fingers extended on the ground, and bringing its body forward by a half-jump. Having a heel, it can stand better than other apes; but this attitude is not common, and Du Chaillu appears to have been mistaken when he describes the gorilla as attacking upright.

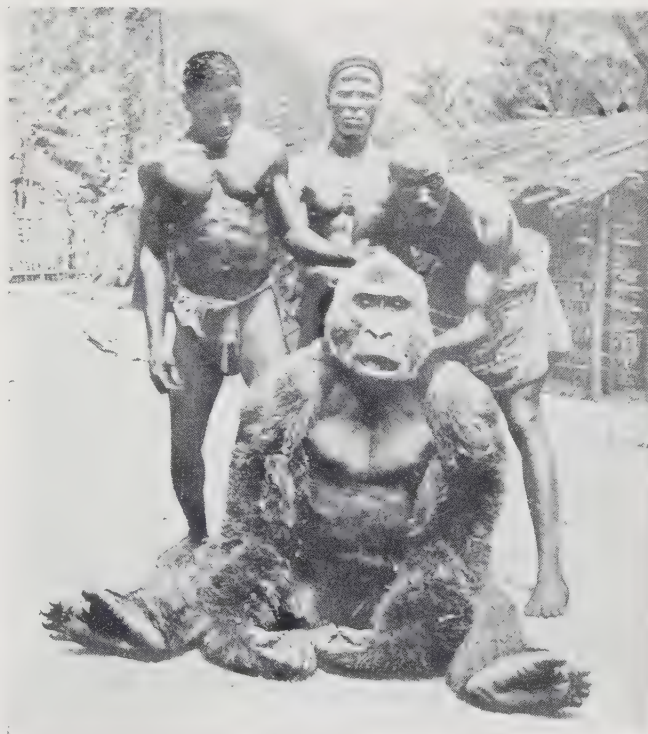
In captivity only immature specimens have been seen—Barnum's great ape being one of the larger forms of chimpanzee. Accounts vary as to the temper of the gorilla, some describing it as untamable, while others say it is docile and playful when young. There is a wonderful tale that a gorilla over 6 feet high was captured near Tanganyika, but nothing more has reached us about it.

When enraged, a gorilla beats its breast, as the writer was informed by a keeper, who thus confirmed Du Chaillu's account. Its usual voice is a grunt, which, when the animal is excited, becomes a roar.

THE ORANG-UTAN

This great red ape was mentioned by Linnæus in 1766, and at the beginning of the last century a specimen living in the Prince of Orange's collection was described by Vosmaer.

There are three varieties of the ORANG, called by the Dyaks MIAS-



By permission of Herr Omlauff]

[Hamburg

A MALE GORILLA

This photograph of the largest gorilla known was taken immediately after death by Herr Paschen at Yaunde, and gives an excellent idea of the size of these animals as compared with Negroes. The animal weighed 400 lbs.

PAPPAN, MIAS-RAMBI, and MIAS-KASSU, the third of which is smaller, has no cheek-excrecences, and very large teeth. Some naturalists recognise a pale and a dark race.

Most of our information is due to Raja Brooke and Dr. Wallace. The species is confined to Borneo and Sumatra, but fossils have been found in India of this genus, as well as of a chimpanzee. The orang is less man-like than the chimpanzee and gorilla. In height the male varies from 3 feet 10 inches to 4 feet 6 inches, the female being a few inches shorter. It is a heavy creature, with large head—often a foot in breadth—thick neck, powerful arms, which reach nearly to the ankles, and protuberant abdomen. Its legs are short and bowed. The forehead is high, the nose fairly large, the ears very human. The throat is ornamented with large pouches, and there are often callosities on the cheeks. The fingers are webbed, the thumb small, the foot long

and narrow, the great toe small and often without a nail. The brain is man like, and the ribs agree in number with those of man; but there are nine bones in the wrist, whereas man, the gorilla, and the chimpanzee have but eight. The canine teeth are enormous in the male. The hair, a foot or more long on the shoulders and thighs, is yellowish red: there is a slight beard. The skin is gray or brown, and often, in adults, black.

The orang is entirely a tree-living animal, and is only found in moist districts where there is much virgin forest. On the ground it progresses clumsily on all-fours, using its arms as crutches, and with the side only of its feet on the ground. In trees it travels deliberately but with perfect ease, swinging along underneath the branches, although



Photo by Ottomar Anschütz

[Berlin

YOUNG ORANG-UTANS

It will be seen here, from the profile, that the young anthropoid ape has only the upper part of the head at all approaching the human type

it also walks along them semi-erect. It lives alone with mate and young, and builds a sleeping place sufficiently low to avoid the wind. Its food is leaves and fruit, especially the durian; its feeding-time, midday.

No animal molests the mias save—so say the Dyaks—the python and crocodile, both of which it kills by tearing with its hands. It never attacks man, but has been known to bite savagely when brought to bay, and it is very tenacious of life, one being found by Mr. Wallace still alive after a fall from a tree, when “both legs had been broken, its hip-joint and the root of the spine shattered, and two bullets flattened in neck and jaws.”

In captivity young orangs are playful and docile, but passionate. Less intelligent than chimpanzees, they may be taught to eat and drink nicely, and to obey simple commands. One in the Zoo at present has acquired the rudiments of drill. They will eat meat and eggs, and drink wine, beer, spirits, and tea. An orang described years ago by Dr. Clarke Abel was allowed

Photo by Ottomar Anschütz

BABY ORANG-UTANS AT PLAY

[Berlin]



the run of the ship on the voyage to England, and would play with the sailors in the rigging. When refused food he pretended to commit suicide, and rushed over the side, only to be found under the chains.

The orang is the least interesting of the three great apes; he lacks the power and brutality of the gorilla and the intelligence of the chimpanzee. "The orang," said its keeper to the writer, "is a buffoon; the chimpanzee, a gentleman."

It is worth remark that, although all these apes soon die in menageries, in Calcutta, where they are kept in the open, orangs thrive well.

THE GIBBONS

Next after the great apes in man-like characters come a few long-armed, tailless apes, known as the GIBBONS. Like the orang-utan, they live in the great tropical forests of Asia, especially



Photo by Ottomar Anschütz

[Berlin]

TWO BABY ORANG-UTANS. THE TUG-OF-WAR

the Indian Archipelago; like the latter, they are gentle, affectionate creatures; and they have also a natural affection for man. But it is in mind and temperament, rather than in skeleton, that the links and differences between men and monkeys must be sought. It will be found that these forest apes differ from other animals and from the true monkeys mainly in this—that they are predisposed to be friendly to man and to obey him, and that they have no bias towards mischief, or "monkey tricks." They are thoughtful, well behaved, and sedate.

The SIAMANG, one of the largest of the long-armed, tailless gibbons, lives in the Malay Archipelago. The arms of a specimen only 3 feet high measured 5 feet 6 inches across. This, like all the gibbons, makes its way from tree to tree mainly by swinging itself by its arms. But the siamang can *walk* upright and run. One kept on board ship would walk down the cabin breakfast-table without upsetting the china. The WHITE-HANDED GIBBON is found in Tenasserim,

southwest of Burma. This ape has a musical howl, which the whole flock utters in the early mornings on the tree-tops. In Northern India, in the hills beyond the Brahmaputra, lives another gibbon, the HULOCK. One of these kept in captivity soon learnt to eat properly at meals, and to drink out of a cup, instead of dipping his fingers in the tea and milk and then sucking them. The SILVERY GIBBON kept at the Zoological Gardens was a most amiable pet, and had all the agility of the other gibbons. It is very seldom seen in this country, being a native of Java, where it is said to show the most astonishing activity among the tall cane-groves. One of the first ever brought to England belonged to the great Lord Clive. The AGILE GIBBON is another and darker ape of this group.

The list of the man-like ape closes with this group. All the gibbons are highly specialised for tree-climbing and an entirely arboreal life; but it is undeniable that, apart from the modifications necessary for this, such as the abnormal length of the arms, the skeleton closely resembles that of the human being. In their habits, when wild, none of these apes show any remarkable degree of intelligence; but their living is gained in so simple a way, by plucking fruits and leaves, that there is nothing in their surroundings to

stimulate thought. They do not need even to think of a time of famine or winter, or to lay up a stock of food for such a season, because they live in the forests under the Equator.

MONKEYS

THE DOG-SHAPED MONKEYS

AFTER the gibbons come a vast number of monkeys of every conceivable size, shape, and variety, which naturalists have arranged in consecutive order with fair success. Until we reach the Baboons, and go on to the South American Monkeys and the Lemurs, it is not easy to give any idea of what these monkeys do or look like merely by referring to their scientific groups. The usual order of natural histories will here be followed, and the descriptions will, so far as possible, present the



Photo by York & Son]

[Notting Hill

WHITE-HANDED GIBBON

This gibbon is found in the forests of the Malay Archipelago



Photo by York & Son]

[Notting Hill

HULOCK GIBBON

The great length of arm in comparison with the body and head should here be noted



Photo by A. S. Rudland & Sons

HEAD OF PROBOSCIS MONKEY

A native of Borneo. Next to the orang-utan, the most striking monkey in the Malay Archipelago

shoot. "I saw altogether about 150 of these monkeys, and without a single exception all were in trees over the water, either lake, river, or in submerged forest. As long as they are in sight, they are very conspicuous objects, choosing the most commanding positions on open tree-tops. Once I saw thirteen in one tree, sitting lazily on the branches, as is their habit, sunning themselves, and enjoying the scenery." They are very striking animals in colour, as well as in form. The face is cinnamon-brown, the sides marked with reddish brown and white, the belly white, the back red-brown and dark brown. Next to the orang-utan, these are the most striking monkeys in the Malay Archipelago.

The greater number of the species intermediate between the gibbons and the New World species are called "DOG-SHAPED" MONKEYS. We wonder why? Only the baboon and a few others are in the least like dogs. The various SACRED MONKEYS of India are often seen in this country, and are quite representative of the "miscellaneous" monkeys in general. Most of them have cheek-pouches, a useful monkey-pocket. They poke food into their pouches, which unfold to be filled, or lie flat when not wanted; and with a pocketful of nuts or rice on either side of their faces, they can scream, eat, bite, or scold quite comfortably, which they could not do with their mouths full. The pouchless monkeys have only their big stomachs to rely on.

The ENTELLUS MONKEY is the most sacred of all in India. It is gray above and nutty brown below, long-legged and active, a thief and an impudent robber. In one of the Indian cities they became such a nuisance that the faithful determined to catch and send away some hundreds. This was done, and the holy monkeys were deported in covered carts, and released many miles off. But the monkeys were too clever. Having thoroughly enjoyed their ride, they all refused to part with the carts, and, hopping and grimacing, came leaping all the way back beside them to the city, grateful for their outing. One city obtained leave to kill the monkeys;

habits and appearance of the monkeys specially noticed.

This great family of true monkeys contains the Sacred Monkeys, or Langurs, of India, the Guerezas and Guenons of Africa, the Mangabeys, Macaques, and Baboons. Most of them have naked, hard patches of skin on the hindquarters, and the partition between the nostrils is narrow. Some have tails, some none, and they exhibit the most astonishing differences of size and shape. Perhaps the most grotesque and astonishing of them all is the PROBOSCIS MONKEY. It is allied to the langurs, and is a native of the island of Borneo, to which it is confined; its home is the west bank of the Sarawak River. It is an arboreal creature, living in small companies. Mr. Hose, who saw them in their native haunts, says that the proboscis monkeys kept in the trees overhanging the river, and were most difficult to

but the next city then sued them for "killing their deceased ancestors." In these monkey-infested cities, if one man wishes to spite another, he throws a few handfuls of rice on to the roof of his house about the rainy season. The monkeys come, find the rice, and quietly lift off many of the tiles and throw them away, seeking more rice in the interstices.

This is not the monkey commonly seen in the hills and at Simla. The large long-tailed monkey there is the HIMALAYAN LANGUR, one of the common animals of the hills. "The langur," says Mr. Lockwood Kipling in his "Beast and Man in India," "is, in his way, a king of the jungle, nor is he often met with in captivity. In some parts of India troops of langurs come bounding with a mighty air of interest and curiosity to look at passing trains, their long tails



Photo by A. S. Rudland & Sons

CROSS-BEARING LANGUR AND YOUNG

A forest monkey of Borneo

lifted like notes of interrogation; but frequently, when fairly perched on a wall or tree alongside, they seem to forget all about it, and avert their heads with an affectation of languid indifference."

In India no distinction is made between monkeys. It is an abominable act of sacrilege to kill one of any kind. In the streets holy bulls, calves, parakeets, sparrows, and monkeys all rob the shops. One monkey-ridden municipality sent off its inconvenient but holy guests by rail, advising the station-master to let them loose at the place to which they were consigned. The station, Saharanpur, was a kind of Indian Chicago, and the monkeys got into the engine-sheds and workshops among the driving-wheels and bands. One got in the double roof of an inspection-

car, and thence stole mutton, corkscrews, camp-glasses, and dusters. Among many other interesting and correct monkey stories of Mr. Kipling's is the following: "The chief confectioner of Simla had prepared a most splendid bride-cake, which was safely put by in a locked room, that, like most back rooms in Simla, looked out on the mountainside. It is little use locking the door when the window is left open. When they came to fetch the bride-cake, the last piece of it was being handed out of the window by a chain of monkeys, who whitened the hillside with its fragments."

From India to Ceylon is no great way, yet in the latter island different monkeys are found. The two best known are the WHITE-BEARDED WANDEROO MONKEY and the GREAT WANDEROO. Both are grave, well-behaved monkeys. The former has white whiskers and a white beard, and looks so wise he is called in Latin *Nestor*, after the ancient counsellor of the Greeks. Nice, clean little monkeys are these, and pretty pets. The great wanderoo is rarer. It lives in the hills. "A flock of them," says Mr. Dallas, "will take possession of a palm-grove, and so well can they conceal themselves in the leaves that the whole party become invisible. The presence of a dog excites their irresistible curiosity, and in order to watch his movements they never fail to betray themselves. They may be seen congregated on the roof of a native hut. Some years ago the child of a European clergyman, having been left on the ground by a nurse, was bitten and teased to death by them. These monkeys have only one wife." Near relatives of the langurs are the two species of SNUB-NOSED MONKEYS, one of which (see figure on page 18) inhabits Eastern Tibet and Northwestern China, and the other the valley of the Mekong.



Photo by A. S. Rudland & Sons

MALE HIMALAYAN LANGUR

A king of the jungle, not often met with in captivity

THE GUEREZAS AND GUENONS

Among the ordinary monkeys of the Old World are some with very striking hair and colours. The GUEREZA of Abyssinia has bright white and black fur, with long white fringes on the sides. This is the black-and-white skin fastened by the Abyssinians to their shields, and, if we are not wrong, by the Kaffirs also. Among the GUENONS, a large tribe of monkeys living in the African forests, many of which find their way here as "organ monkeys," is the DIANA, a most beautiful creature, living on the Guinea Coast. It has a white crescent on its forehead, bluish-gray fur, a white beard, and a patch of brilliant chestnut on the back, the belly white and orange. A lady, Mrs. Bowditch, gives the following account of a Diana monkey on board ship. It jumped on to her shoulder, stared into her face, and then made friends, seated itself on her knees, and carefully examined her



GELADA BABOONS AT HOME

This photograph is probably unique, as a gelada baboon has been rarely seen. It shows them at home looking for food on the ground under the bamboos and palms. It was taken by Lord Delamere in the East African jungle



Photo by A. S. Rudland & Sons

MANTLED GUEREZA

This group of monkeys supplies the "monkey muffs" once very fashionable. The species with white plumes is used to decorate the Kaffir shields

hands. "He then tried to pull off my rings, when I gave him some biscuits, and making a bed for him with my handkerchief he then settled himself comfortably to sleep; and from that moment we were sworn allies. When mischievous, he was often banished to a hen-coop. Much more effect was produced by taking him in sight of the panther, who always seemed most willing to devour him. On these occasions I held him by the tail before the cage; but long before I reached it, knowing where he was going, he pretended to be dead. His eyes were closed quite fast, and every limb was as stiff as though there were no life in him. When taken away, he would open one eye a little, to see whereabouts he might be; but if he caught sight of the panther's cage it was instantly closed, and he became as stiff as before." This monkey stole the men's knives, tools, and handkerchiefs, and even their caps, which he threw into the sea. He would carefully feed the parrots, chewing up biscuit and presenting them the bits; and he caught another small monkey and painted it black! Altogether, he must have enlivened the voyage. The GRIVET MONKEY, the GREEN MONKEY, the MONA MONKEY, and the MANGABEY are other commonly seen African species.

THE MACAQUES

The MACAQUES, of which there are many kinds, from the Rock of Gibraltar to far Japan, occupy the catalogue between the guenon and the baboon. The COMMON MACAQUE and many others have tails. Those of Japan, and some of those of China, notably the TCHELI MONKEY, kept outside the monkey-house at the Zoo, and the JAPANESE MACAQUE, at the other entrance, are tailless, and much more like anthropoid apes. The Tcheli monkey is large and powerful, but other macaques are of all sizes down to little creatures no bigger than a kitten. Some live in the hottest plains, others in the mountains. The COMMON MACAQUE, found in the Malay Archipelago, is a strong, medium-sized monkey. The FORMOSAN MACAQUE is a rock-living creature; those of Japan inhabit the pine-groves, and are fond of pelting any one who passes with stones and fir-cones. The BONNET MACAQUE is an amusing little beast, very fond of hugging and nursing others in captivity. The BANDAR or RHESUS MONKEY, a common species, also belongs to this group. But the most interesting to Europeans is the MAGOT, or BARBARY APE. It is the last monkey left in Europe. There it only lives on the Rock of Gibraltar. It was the monkey which Galen is said to have dissected, because he was not permitted to dissect a human body. These monkeys are carefully preserved upon the Rock. Formerly, when they were more com-



Photo by L. Medland, F.Z.S.]

North Finchley

DIANA MONKEY

One of the most gaily coloured monkeys of Africa

THE BABOONS

Far the most interesting of the apes in the wild state are the BABOONS. Their dog-like heads (which in some are so large and hideous that they look like a cross between an ill-tempered dog and a pig), short bodies, enormously strong arms, and loud barking cry distinguish them from all other creatures. The greater number—for there are many kinds—live in the hot, dry, stony parts of Africa. They are familiar figures from the cliffs of Abyssinia to the Cape, where their bold and predatory bands still occupy Table Mountain. They are almost the only animals which the high-contracting Powers of Africa have resolved not to protect at any season, so mischievous are they to crops, and recently to the flocks. They kill the suckling lambs, and tear them to pieces for the sake of the milk contained in their bodies.

One of the best-known baboons is the CHACMA of South Africa. The old males grow to a great size, and are most formidable creatures. Naturally, they are very seldom caught; but one very large one is in the Zoological Gardens, Regent's Park, at the time of writing. The keeper declares he would rather go into a lion's cage than into the den of this beast when angry. Its head is nearly one-third of its total length from nose to the root of the tail. Its jaw-power is immense, and its forearm looks as strong as Sandow's.

mon, they were very mischievous. The following story was told by Mr. Bidcup: "The apes of the Rock, led by one particular monkey, were always stealing from the kit of a certain regiment encamped there. At last the soldiers caught the leader, shaved his head and face, and turned him loose. His friends, who had been watching, received him with a shower of sticks and stones. In these desperate circumstances the ape sneaked back to his old enemies, the soldiers, with whom he remained." Lord Heathfield, a former Governor of the Rock, would never let them be hurt; and on one occasion, when the Spaniards were attempting a surprise, the noise made by the apes gave notice of their attempt.



Photo by G. W. Wilson & Co., Ltd.]

Averara

BARBARY APE

The last of the European monkeys on this side of the Mediterranean; and it is only found on the Rock of Gibraltar



Photo by C. Reid]

[Wishaw, N. B.

RHESUS MONKEY*A young specimen of the common Bengal monkey*

Like all monkeys, this creature has the power of springing instantaneously from a sitting position; and its bite would cripple anything from a man to a leopard. The chacmas live in companies in the kopjes, whence they descend to forage the mealie-grounds, river-beds, and bush. Thence they come down to steal fruit and pumpkins or corn, turn over the stones and catch beetles, or eat locusts. Their robbing expeditions are organised. Scouts keep a lookout, the females and young are put in the centre, and the retreat is protected by the old males. Children in the Cape Colony are always warned not to go out when the baboons are near. When irritated—and they are very touchy in their tempers—the whole of the males will sometimes charge and attack. The possibility of this is very unpleasant, and renders people cautious.

Not many years ago a well-known sportsman was shooting in Somaliland. On the other side of a rocky ravine was a troop of baboons of a species of which no examples were in the British Museum. Though he knew the danger, he was tempted to shoot and to secure a skin. At 200 yards he killed one dead, which the rest did not notice. Then he hit another and wounded it. The baboon screamed, and instantly the others sat up, saw the malefactor, and charged straight for him. Most fortunately, they had to scramble down the ravine and up again, by which time the sportsman and his servant had put such a distance between them, making "very good time over the flat," that the baboons contented themselves by barking defiance at them when they reached the level ground.

They are the only mammals which *thoroughly* understand combination for defense as well as attack. But Brehm, the German traveler, gives a charming story of genuine courage and self-sacrifice shown by one. His hunting dogs gave chase to a troop which was retreating to some cliffs, and cut off a very young one, which ran up on to a rock, only just out of reach of the dogs. An old male baboon saw this, and came along to the rescue. Slowly and deliberately he descended, crossed the open space, and stamping his hands on the ground, showing his teeth, and backed by the furious barks of the rest of the baboons, he disconcerted and cowed these savage dogs, climbed on to the rock, picked up the baby, and carried him back safely. If the dogs had attacked the old patriarch, his tribe would probably have helped him. Burchell, the naturalist after whom Burchell's zebra is named, let his dogs chase a troop. The baboons turned on them, killed one on the spot by biting through the great blood-vessels of the neck, and laid bare the ribs of



Photo by A. S. Rudland & Sons

RHESUS MONKEY AND SOOTY MANGABEY

The sooty mangabey (to the right of the picture) is gentle and companionable, but petulant and active



Photo by L. Medland, F.Z. S., North Finchley
GREY-CHEEKED MANGABEY

One of the small African monkeys

another. The Cape Dutch in the Old Colony would rather let their dogs bait a lion than a troop of baboons. The rescue of the infant chacma which Brehm saw himself is a remarkable, and indeed the most incontestable, instance of the exhibition of courage and self-sacrifice by a *male* animal.

If the baboons were not generally liable to become bad-tempered when they grow old, they could probably be

trained to be among the most useful of animal helpers and servers; but they are so formidable, and so uncertain in temper, that they are almost too dangerous for attempts at semi-domestication. When experiments have been made, they have had remarkable results. Le Vaillant, one of the early explorers in South Africa, had a chacma baboon which was a better watch than any of his dogs. It gave warning of any creature approaching the camp at night long before the dogs could hear or smell it. He took it out with him when he was shooting, and used to let it collect edible roots for him. The latest example of a trained baboon only died a few years ago. It belonged to a railway signalman at Uitenhage station, about 200 miles up-country from Port Elizabeth, in Cape Colony. The man had the misfortune to undergo an operation in which both his feet were amputated, after being crushed by the wheels of a train. Being an ingenious fellow, he taught his baboon, which was a full-grown one, to pull him along the line on a trolley to the "distant" signal. There the baboon stopped at the word of command, and the man would work the lever himself. But in time he taught the baboon to do it, while he sat on the trolley, ready to help if any mistake were made.

The chacmas have for relations a number of other baboons in the rocky parts of the African Continent, most of which have almost the same habits, and are not very different in appearance. Among them is the GELADA BABOON, a species very common in the rocky highlands of Abyssinia; another is the ANUBIS BABOON of the West Coast of Africa. The latter is numerous round the Portuguese settlement of Angola. Whether the so-called COMMON BABOON of



Photo by A. S. Rudland & Sons
CHINESE MACAQUE

This monkey lives in a climate as cold as ours



Photo by York & Son, Notting Hill

GRIVET MONKEY

This is the small monkey commonly taken about with street-organs



Photo by A. S. Rudland & Sons

BONNET MONKEY, AND ARABIAN BABOON (ON THE RIGHT)



Photo by L. Medland, F.Z.S.]

[North Finchley

RHESUS MONKEYS

This photograph is particularly interesting. It was actually taken by another monkey, which pressed the button of Mr. Medland's camera

size, and are probably the most hideous of all beasts. The frightful nose, high cheek-bones, and pig-like eyes are the basis of the horrible heads of devils and goblins which Albert Dürer and other German or Dutch mediæval painters sometimes put on canvas. Add to the figure the misplaced bright colours—cobalt-blue on the cheeks, which are scarred, as if by a rake, with scarlet furrows, and scarlet on the buttocks—and it will be admitted that nature has invested this massive, powerful, and ferocious baboon with a repulsiveness equaling in completeness the extremes of grace and beauty manifested in the roe-deer or the bird of paradise.

The natives of Guinea and other parts of West Africa have consistent accounts that the mandrills have tried to carry off females and children. They live in troops like the chacmas, plunder the fields, and, like all baboons, spend much time on the ground walking on all-fours. When doing this, they are quite unlike any other creatures. They walk slowly, with the head bent downwards, like a person walking on hands and knees looking for a pin. With the right hand (usually) they turn over every stick and stone, looking for insects, scorpions, or snails, and these they seize and eat. The writer has seen

the menageries is a separate species or only the young of some one of the above-mentioned is not very clear. But about another variety there can be no doubt. It has been separated from the rest since the days of the Pharaohs. It does not differ in habits from the other baboons, but inhabits the rocky parts of the Nile Valley. It appears in Egyptian mythology under the name of Thoth, and is constantly seen in the sculptures and hieroglyphs.

Equally strong and far more repulsive are the two baboons of West Africa—the DRILL and the MANDRILL. As young specimens of these beasts are the only ones at all easily caught, and these nearly always die when cutting their second teeth when in captivity, large adult mandrills are seldom seen in Europe. They grow to a great



Photo by A. S. Rudland & Sons

ORANGE SNUB-NOSED MONKEY

This should be contrasted with the Proboscis Monkey

baboons picking up sand, and straining it through their fingers, to see if there were ants in it. He has also seen one hold up sand in the palm of its hand, and blow the dust away with its breath, and then look again to see if anything edible were left. Mandrills kept in captivity until adult become very savage. One in Wombwell's menagerie killed another monkey and a beagle. Mr. Cross owned one which would sit in an armchair, smoke, and drink porter; but these convivial accomplishments were accompanied by a most ferocious temper.

One of the earliest accounts of the habits of the Abyssinian baboons was given by Ludolf in his "History of Ethiopia." It was translated into quaint, but excellent old English: "Of Apes," he says, "there are infinite flocks up and down in the mountains, a thousand and more together, and they leave no stone unturned. If they meet with one that two or three cannot lift they call for more aid, and all for the sake of the Worms that lye under, a sort of dyet which they relish exceedingly. They are very greedy after Emmets. So that having found an emmet hill, they

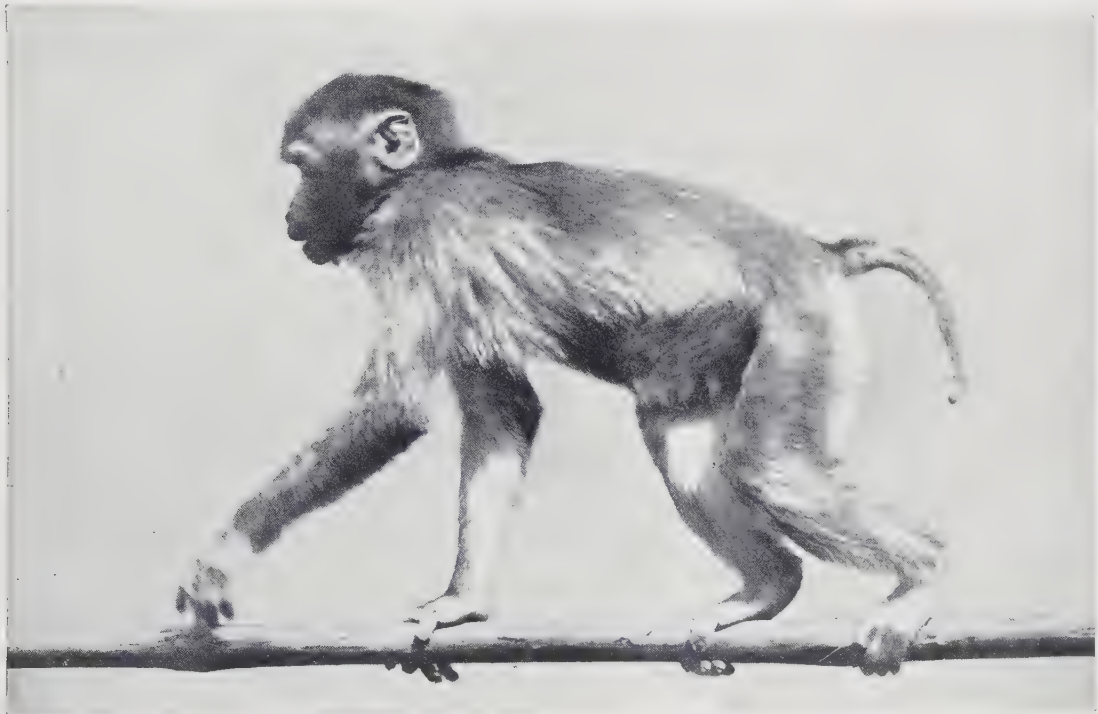


Photo by Ottomar Anschütz

[Berlin

PIG-TAILED MONKEY

"Footing the line." Note how the monkey uses its feet as hands when walking on a branch

presently surround it, and laying their fore paws with the hollow downward upon the ant heap, as soon as the Emmets creep into their treacherous palms they lick 'em off, with great comfort to their stomachs. And there they will lye till there is not an Emmet left. They are also pernicious to fruits and apples, and will destroy whole fields and gardens unless they be looked after. For they are very cunning, and will never venture in till the return of their spies, which they send always before, who, giving all information that it is safe, in they rush with their whole body and make a quick despatch. Therefore they go very quiet and silent to their prey; and if their young ones chance to make a noise, they chastise them with their fists; but if the coast is clear, then every one has a different noise to express his joy." Ludolf clearly means the baboons by this description.

A more ancient story deals with Alexander's campaigns. He encamped on a mountain on which were numerous bands of monkeys (probably baboons). On the following morning the sentries saw what looked like troops coming to offer them battle. As they had just won a



Photo by Ottomar Anschütz

[Berlin]

CHACMA BABOON

This photograph shows his attitude when about to make an attack

victory, they were at a loss to guess who these new foes might be. The alarm was given, and the Macedonian troops set out in battle-array. Then through the morning mists they saw that the enemy was an immense troop of monkeys. Their prisoners, who knew what the alarm was caused by, made no small sport of the Macedonians.

THE SPEECH OF MONKEYS

Something should be said of the alleged "speech of monkeys" which Professor Garner believed himself to have discovered. He rightly excluded mere sounds showing joy, desire, or sorrow from the faculty of speech, but claimed to have detected special words, one meaning "food," another "drink," another "give me that," another meaning "monkey," or an identification of a second animal or monkey. He used a phonograph to keep permanent record of the sounds, and made an expe-

dition to the West African forests in the hope that he might induce the large anthropoid apes to answer the sounds which are so often uttered by their kind in our menageries. The enterprise ended, as might have been expected, in failure. Nor was it in the least necessary to go and sit in a cage in an African forest in the hope of striking up an acquaintance with the native chimpanzees. The little Capuchin monkeys, whose voices and sounds he had ample opportunity of observing here, give sufficient material for trying experiments in the meaning of monkey sounds. The writer believes that it is highly probable that the cleverer monkeys have a great many notes or sounds which the others do understand, if only because they make the same under similar circumstances, otherwise they would not utter them. They are like the sounds which an intelligent but nearly dumb person might make. Also they have very sharp ears, and some of them can understand musical sounds, so far as to show a very marked attention to them. The following account of an experiment of this kind, when a violin was being played, is related in "Life at the Zoo": "The Capuchin monkeys, the species selected by Professor Garner for his experiments in monkey language, showed the strangest and most amusing excitement. These pretty little creatures have very expressive and intelligent faces, and the play and mobility of their faces and voices while listening to the music were extraordinarily rapid. The three in the first cage at once rushed up into their box, and then all peeped out, chattering and excited. One by one they came down, and listened to the music with intense curiosity, shrieking and making faces at a crescendo, shaking the wires angrily at a discord, and



Photo by C. Reid]

[Wishaw, N. B.

A YOUNG MALE CHACMA BABOON

Note the protruding tusk in the upper jaw. A baboon sitting in this position of rest can instantly leap six or seven feet, and inflict a dangerous bite



Photo by A. S. Rudland & Sons]

HEAD OF MALE MANDRILL

This is one of the most hideous of living animals. The natives of West Africa hold it in greater dislike even than the large carnivora, from the mischief it does to their crops



Photo by L. Medland, F.Z.S., North Finchley

BROWN CAPUCHIN

The most intelligent of the common monkeys of America. It uses many sounds to express emotions, and perhaps desires

putting their heads almost upside-down in efforts at acute criticism at low and musical passages. Every change of note was marked by some alteration of expression in the faces of the excited little monkeys, and a series of discordant notes roused them to a passion of rage." At the same time a big baboon, chained up near, evidently disliked it. He walked off in the opposite direction to the farthest limits of his chain.

THE AMERICAN MONKEYS

Mention of the Capuchins takes us to the whole group of the American Monkeys. Nearly all of these live in the tropical forests of Brazil, Guiana, Venezuela, and Mexico. They are all different from the Old World monkeys, and many are far more beautiful. The most attractive of the hardier kinds are the Capuchins; but there are many kinds of rare and delicate little monkeys more beautiful than any squirrel, which would make the most delightful pets in the world, if they were not so delicate. To try to describe the Old World monkeys in separate groups from end to end is rather a hopeless task. But the American monkeys are more manageable by the puzzled amateur. Most of them have a broad and marked division between the nos-

trils, which are not mere slits close together, but like the nostrils of men. They also have human-looking rounded heads. Their noses are of the "cogitative" order, instead of being

snouts or snubs with narrow openings in them; and the whole face is in many ways human and intelligent. The HOWLER MONKEYS, which utter the most hideous sounds ever heard in the forests, and the SPIDER MONKEYS are the largest. The latter have the most wonderfully developed limbs and tails for catching and climbing of any living animals. As highly specialised creatures are always interesting, visitors to any zoological garden will find it worth while to watch a spider monkey climbing,



Photo by L. Medland, F.Z.S., North Finchley

DRILL

Only less ugly than the Mandrill. Its habits are the same



Photo by A. S. Rudland & Sons

RED HOWLER MONKEY

The male possesses a most extraordinary voice

on to the opposite shoulder, and brush the fur on their upper arm. The end of the tail seems always "feeling" the air or surroundings, and has hairs, thin and long, at the end, which aid it in knowing when it is near a leaf or branch. It is almost like the tentacle of some sea zoophyte. Gentle creatures, all of them, are these spider monkeys. One of them, of the species called WAITA, when kept in captivity, wore the fur off its forehead by rubbing its long gaunt arms continually over its brow whenever it was scolded. The spider monkeys differ only in the degree of spidery slenderness in their limbs. In disposition they are always amiable, and in habits tree climbers and fruit-eaters.

The CAPUCHINS are, in the writer's opinion, the nicest of all monkeys. Many species are known, but all have the same round merry faces, bright eyes, pretty fur, and long tails. There is always a fair number at the Zoological Gardens. They are merry, but full of fads. One hates children and loves ladies; another adores one or two other monkeys, and screams at the rest. All are fond of insects as well as of fruit. A friend of the writer kept one in a large house in Leicestershire. It was not very good-tempered, but most amusing, climbing up the blind-cord first, and catching and eating the flies on the window-panes most dexterously, always avoiding the wasps. This monkey was taught to put out a lighted paper (a useful accomplishment) by dashing its hands on to the burning part, or, if the paper were twisted up, by taking the unlighted end and beating the burning part on the ground; and it was very fond of turning the leaves of any large book. This it did not only by vigorous use of both arms and hands, but by putting its head under too, and "heaving" the leaves over.

In the private room behind the monkey-house at the Zoo there are always a number of the

just as it is always worth while to watch a great snake on the move. The tail is used as a fifth hand: the Indians of Brazil say they catch fish with it, which is not true. But if you watch a spider monkey moving from tree to tree, his limbs and tail move like the five fingers of a star-fish. Each of the extremities is as sensitive as a hand, far longer in proportion than an ordinary man's arm, and apparently able to work independently of joints. The monkey can do so many things at once that no juggler can equal it. It will hold fruit in one hand, pick more with one foot, place food to the mouth with another hand, and walk and swing from branch to branch with the other foot and tail, all simultaneously. These monkeys have no visible thumb, though dissection shows that they have a rudimentary one; but the limbs are so flexible that they can put one arm round behind their heads over



Photo by A. S. Rudland & Sons

A SPIDER MONKEY

This monkey is specially adapted for arboreal life. The tail acts as a fifth hand



Photo by Scholastic Photo. Co.]

[Parson's Green

PATAS MONKEY

Found in West Africa. A large and brilliantly coloured species

allied tamarins as presents for friends at home in England; the Brazilians themselves like to have them as pets also; so there is to some extent a trade demand for them.

Among the most delicate of American monkeys are the OUKARIS, which have somewhat human faces, exquisite soft fur, and are as gentle as most of these forest creatures. They seldom live long in captivity, a few months being as much as they will generally endure, even in Brazil. Perhaps the rarest of all is the white-haired SCARLET-FACED OUKARI. This monkey has long white hair from neck to tail, sandy whiskers, and a bright scarlet face. It lives in a district of partly flooded forest, and is only obtained by the Indians using blow-pipes and arrows dipped in very diluted urari poison. The WHITE-HEADED SAKI is a rare and very pretty little monkey of Brazil; and there are a very large number of other species of this group whose names it would be mere weariness to mention. All these small monkeys are very quick and intelligent, while the rapidity of their movements, their ever-changing expression, and sharp, eager cries heighten the idea of cleverness given by their general appearance. Other little imps of these forests are the SQUIRREL MONKEYS. In the common species the face is like a little furry man's, its arms brilliant yellow (as if dipped in gamboge dye), the cheeks pink, and eyes black. In habits it is a quick-tempered, imperious little creature, carnivorous, and a great devourer of butterflies and beetles.

The most beautiful and entertaining of all monkeys are

rare and delicate monkeys from America, which cannot stand the draughts of the outer house, like the Capuchins and spider monkeys. The greater number of these come from tropical America. There, in the mighty forests, so lofty that no man can climb the trees, so dense that there is a kind of upper story on the interlaced tree-tops, where nearly all the birds and many mammals live without descending to earth, forests in which there is neither summer nor winter, but only the changes from hour to hour of the equatorial day, the exquisite MARMOSETS, whose fur looks like the plumage and whose twittering voices imitate the notes of birds, live and have their being. They are all much alike in shape, except that the LION MARMOSET's mane is like that of a little lion clad in floss silk; and they all have sharp little claws, and feed on insects. The PINCHÉ MARMOSET from the Guiana forests has a face like a black Indian chief, with white plumes over his head and neck like those worn by a "brave" in full war-paint. Merchants who do business with Brazil very frequently import marmosets and the closely



Photo by C. Reid]

[Wishaw, N. B.

WANDEROO MONKEY

The number of monkeys which have leonine manes is large. The manes act as capes to keep the dew and wet from their chests and shoulders.



Photo by A. S. Rudland & Sons

COMMON SQUIRREL MONKEY

The squirrel monkeys have soft, bright-coloured fur, and long, hairy tails. They are found from Mexico to Paraguay

these New World species. No person clever at interpreting the ways of animals would fail to consider them far more clever and sympathetic than the melancholy anthropoid apes, while for appearance they have no equals. Probably the most attractive monkey in Europe is a South American one now in the London Zoological Gardens. It was first mentioned to Europeans by Baron von Humboldt, who saw it in the cabin of an Indian on the Orinoco. These forest Indians of South America are gentle creatures themselves. Among other amiable qualities, they have a passion for keeping pets. One who worked for a friend of the writer, with others of his tribe, was asked what he would take in payment, which was given in kind. The others chose cloth, axes, etc. This Indian said that he did not care for any of these things. He said he wanted a "poosa." No one knew what he meant. He signed that he wished to go to the house and would show them. Arrived there, he pointed to the cat! "Pussy," to the Arawak Indian, was a "poosa," and that was what he wanted as a month's wages. Humboldt's Indian had something better than a "poosa." It was a monkey, as black as coal, with a round head, long thickly furred tail, and bright vivacious eyes. The explorer called it the *LAGOTHRIX*, which means Hare-skin Monkey. The fur is not the least like a hare's, but much resembles that of an opossum. The more suitable name is the *WOOLLY MONKEY*. The one kept at the Gardens is a most friendly and vivacious creature, ready to embrace, play and make friends with any well-dressed person. It dislikes people in working-clothes which are dirty or soiled—a not uncommon aversion of clever animals.



Photo by A. S. Rudland & Sons

BLACK-EARED MARMOSET

These are among the prettiest of small tropical monkeys in America: they are insect-feeders, and very delicate



Photo by L. Mediana, F.Z.S.]

HUMBOLDT'S WOOLLY MONKEY

[North Finchley

This is the most popular monkey in captivity. He looks for all the world like a Negro, and has a most beautiful, soft, woolly coat. He is very tame, and loves nothing better than being petted

In spite of all the varieties of *temperament* in the monkey tribe, from the genial little Capuchins to the morose old baboon, they nearly all have one thing in common—that is, the monkey brain. The same curious restlessness, levity, and want of concentration mark them all, except the large anthropoid apes. Some of these have without doubt powers of reflection and concentration which the other monkeys do not possess. But in all the rest, though the capacity for understanding exists, the wish to please, as a dog does, and the desire to remember and to retain what it has learnt, seem

almost entirely wanting. Egoism, which is a sign of human dementia, is a very leading characteristic of all monkeys. There is no doubt that the baboons might be trained to be useful animals if they always served one master. Le Vaillant and many other travelers have noted this. But they are *too clever*, and at the bottom too ill-tempered ever to be trustworthy, even regarded as "watches," or to help in minor manual labour. Baboons would make an excellent substitute for dogs as used in Belgium for light draught; but no one could ever rely on their behaving themselves when their master's eye was elsewhere.

Taken as a family, the monkeys are a feeble and by no means likeable race. They are "undeveloped" as a class, full of promise, but with no performance.

THE LEMURS

THE South American monkeys, with their forms and fur, are followed by a beautiful and of creatures, called the LEMURS, with their Maholis, and Pottos. Their resemblance to their hands and feet. These are real and hands, with proper thumbs. The second always terminates in a long, sharp claw. "Elia," the Indian naturalist, who kept them as pets not themselves with. Some of them sensitive disk, full of extra "Unlike the lively squirrels hiding-places till the tropical when they seek their but by ascending to the and again, at the first ap-the light in the recesses The RING-TAILED LEMUR most of the race are so the light seems to they turn over same inarticu- But at night they fly from so that the whether they ghosts of their

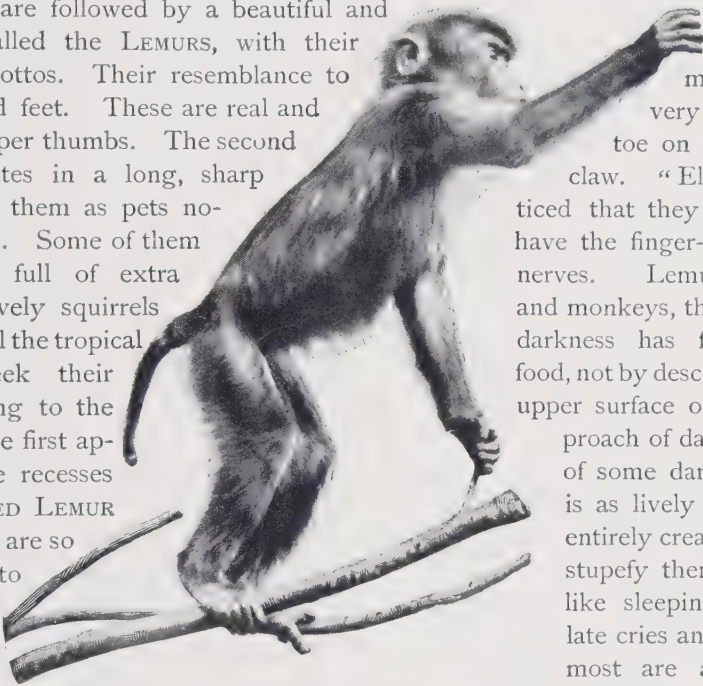


Photo by Ottomar Anschütz

[Berlin

PIG-TAILED MONKEY CATCHING A FLY

Most of the smaller monkeys, as well as the baboons, are fond of eating insects. Beetles, white ants, and flies are eagerly sought and devoured

squirrel-like interesting group cousins the Lorises, monkeys is mainly in very highly developed toe on the hind foot nearly claw. "Elia," the Indian naturalist that they used this to scratch have the finger-tips expanded into a nerves. Lemur means "ghost." and monkeys, they do not leave their darkness has fallen on the forest, food, not by descending to the ground, upper surface of the ocean of trees, proach of dawn, seek refuge from of some dark and hollow trunk. is as lively by day as night; but entirely creatures of darkness that stupefy them. When awakened, like sleeping children, with the late cries and deep, uneasy sighs. most are astonishingly active; tree to tree, heard, but invisible; natives of Madagascar doubt are not true *lemures*, the unquiet departed dead.

Though the lemurs are here treated apart from the other animals of Madagascar, it will be obvious that they are a curious and abnormal tribe. This is true of most of the animals of that great island, which has a fauna differing both from that of the adjacent coast of Africa and from that of India or Australia. In the FOSSA, a large representative of the Civets, it possesses a species absolutely unlike any other. The Aye-aye is also an abnormal creature. Nor must it be forgotten that Madagascar was until recently the home of some of the gigantic ground-living birds. But, after all, none of its inhabitants are more remarkable than its hosts of lemurs, some of which are to be met with in almost every coppice in the island. There are also many extinct kinds.

Exquisite fur, soft and beautifully tinted, eyes of extraordinary size and colour (for the pupil shuts up to a mere black line by day, and the rest of the eye shows like a polished stone of rich brown or yellow or marble gray), are the marks of most of the lemurs. But there are other lemur-like creatures, or "lemuroids," which, though endowed with the same lovely fur, like



Photo by L. Medland, F.Z.S.]

[North Finchley

RING-TAILED LEMUR

This lemur is often kept as a domestic animal, and allowed to run about the house like a cat

island are full of these curious nocturnal beasts, of which there are so many varieties presenting very slight differences of form and habit, that naturalists have some difficulty in giving even a complete list of their species. Add to this that nearly all of them are intensely and entirely nocturnal, and the scarcity of data as to their habits is easily accounted for. When seen by us, their faces all lack expression—that is to say, the eyes, which mainly give expression, seem entirely vacant and meaningless. But this is due to their special adaptation to seeing in the dark tropical night. By day the pupil of the eye almost disappears. If only we could also see in the dark, the eyes of the lemur might have as much expression as those of a faithful dog. The change which night makes in their general demeanour is simply miraculous. By day many of them are like hibernating animals, almost incapable of movement. When once the curtain of night has fallen, they are as active as squirrels, and as full of play as a family of kittens. The RING-TAILED LEMUR is often kept as a pet, both in Madagascar and in the Mauritius. It is one of the very few which are diurnal in their habit. When in a hurry it jumps along, standing on its hind feet, like a little kangaroo, but holding its tail upright behind its back. It will follow people up-stairs in this way, jumping from step to step, with its front paws outstretched, as if it were addressing an audience. The French call these day lemurs MAKIS. The ring-tailed lemur lives largely among rocks and precipices. Most of these creatures live upon fruit, the shoots and leaves of trees, and other vegetable food. But, like the squirrel, they have no objection to eggs and nestlings, and also kill and eat any small birds and insects. Some of the smaller kinds are almost entirely insect-feeders. The largest kind of lemur belongs to the group known as the INDRIS. The BLACK-AND-WHITE INDRI measures about two feet in length. It has only a rudimentary tail, large ears, and a sharp-pointed nose. The amount of white colouring varies much in different individuals. This variation in colouring—a very rare feature among wild mammalia, though one of the first changes shown when animals are domesticated—is also found in the next three species, called SIFAKAS. The DIADEMED SIFAKA, the WOOLLY

softest moss, have no tails. The strangest of all are two creatures called the SLENDER LORIS and the SLOW LORIS. The slender loris, which has the ordinary furry coat of the lemurs, and no tail, moves on the branches exactly as does a chameleon. Each hand or foot is slowly raised, brought forward, and set down again. The fingers then as slowly close on the branch till its grasp is secure. It is like a slow-working mechanical toy. Probably this is a habit, now instinctive, gained by ages of cautiously approaching insects. But the result is to give the impression that the creature is almost an automaton.

Madagascar is the main home of the lemurs, though some of the related animals are also found in Africa and in the East Indies. But the dense forests of the great



Photo by L. Medland, F.Z.S., North Finchley

A DWARF LEMUR

These tiny animals take the place of the domestic mouse in Madagascar

INDRI, and the BLACK INDRI all belong to this group. The SIFAKAS, as some of these and the allied forms are called, are venerated by the Malagasys, who never kill one intentionally. Mr. Foster observes that "they live in companies of six or eight, and are very gentle and inoffensive animals, wearing a very melancholy expression, and being as a rule morose, inactive, and more silent than the other lemurs. They rarely live long in captivity. In their native state they are most alert in the morning and evening, as during the day they conceal themselves under the foliage of trees. When asleep or in repose, the head is dropped on the chest and buried between the arms, the tail rolled up on itself and disposed between the hind legs. The sifakas live exclusively on vegetable substances, fruits, leaves, and flowers, their diet not be-



Photo by L. Medland, F.Z.S.]

[North Finchley

BLACK LEMUR

Found on the coast of Madagascar



Photo by L. Medland, F.Z.S., North Finchley

COQUEREL'S LEMUR

A lemur which strongly objects to being awakened in the day-time

lemur, and pushes out its sharp little face just above the thigh of the mother. The WOOLLY INDRI has more woolly fur than the others of its tribe, a shorter nose, and a longer tail.

THE TRUE LEMURS

Of these there are several species, all confined to Madagascar and the Comoro Islands. One of the best known is the RING-TAILED LEMUR, mentioned above. It is called LEMUR CATTA, the Cat Lemur, from being so often kept in domestication. The WEASEL LEMUR, the GRAY LEMUR, the MOUSE LEMUR, the GENTLE LEMUR, the SPORTIVE LEMUR, the

ing varied, as in the other lemurs, by small birds, eggs, or insects. Their life is almost entirely arboreal, for which the muscles of their hands and feet, as well as the parachute-like folds between their arms and bodies, and their peculiar hooked fingers, are well fitted. The young one is carried by the mother on its back, its hands grasping her armpits tightly."

This is not the universal way of carrying the young among lemurs. The CROWNED LEMUR, a beautiful gray-and-white species, often breeds at the Zoo. The female carries its young one partly on its side. The infant clings tightly with arms and tail round the very slender waist of the



Photo by L. Medland, F.Z.S.]

[North Finchley

RUFFED LEMUR

Another of the nocturnal lemurs. It lives mainly on fruit and insects



Photo by L. Medland, F.Z.S.]

[North Finchley

GARNETT'S GALAGO*One of the squirrel-like lemuroids*

supials take the place of all kinds of ordinary mammals. There are marsupial rats, marsupial wolves, marsupial squirrels, and even marsupial moles. The small squirrel and rat-like lemurs are called **CHIROGALES**. **COQUEREL'S LEMUR** is really a chirogale. It is a quaint and by no means amiable little animal, sleeping obstinately all day, and always ready to growl and bite if disturbed. Its colour is brownish gray and cream-colour. A pair of these, rolled up tightly into balls in a box of hay, will absolutely refuse to move, even when handled. They only feed by night.

THE GALAGOS

An allied group, confined to tropical Africa, is that of the **GALAGOS**. They are most beautiful little creatures, whose nearest relatives are the Malagasy lemurs. Generally speaking, they have even more exquisite fur than the lemurs. It is almost as soft as floss silk, and so close that the hand sinks into it as into a bed of moss. The colour of the fur is rich and pleasing, generally some shade of brown. The head is small, the nose pointed, and the ears thin, hairless, and capable of being folded up, like the wings of a beetle. But the most beautiful feature of the galagos is their eyes. These are of immense size, compared with the head. The eye is of the richest and most beautiful brown, like a cairngorm stone, but not glassy or clear. Though quite translucent, the eye is marked with minute dividing-lines, like the grain in an agate—a truly exquisite object. When handled or taken in the arms, the little galago clasps the fingers or sleeve tightly, as if it thought it was holding a tree, and shows no disposition to escape. A family of three or four young ones, no larger than mice, with their large-eyed mother attending to them, forms an exquisitely dainty little group. The galagos vary from the size of a squirrel to that of a small cat. The kind most often seen in England is the **MAHOLI GALAGO** from East Africa. Another species comes from Senegal, and others from Calabar and the forests of the Gold Coast. **GARNETT'S GALAGO**, another species, is shown above. They may be regarded as nocturnal tropical lemuroids, analogous to the chirogales of Madagascar. It has been suggested, with great probability, that the intensely drowsy sleep of many of the lemuroid animals corresponds to the hiberna-

CROWNED LEMUR, and **COQUEREL'S LEMUR**, all represent various small, pretty, and interesting varieties of the group. The **BLACK-AND-WHITE LEMUR**, one of the larger kinds, is capable of domestication. A specimen kept in a London house, where the present writer saw it, was always called "Pussy" by the children. The other small kinds are very like squirrels, mice, weasels, and other creatures, with which they have no connection. It seems as though the curiously limited and primitive fauna of Madagascar tried to make up for its want of variety by mimicking the forms of other animals, and something of the same kind is seen in Australia, where the mar-



Photo by L. Medland, F.Z.S.]

[North Finchley

MAHOLI GALAGO

This little animal is a native of East Africa. It has very large eyes, and fur as soft as the chinchilla's



Photo by L. Medland, F.Z.S.]

[North Finchley

SLENDER LORIS

This extraordinary creature has the habits of a chameleon when seeking insects for food. The photograph is unique

pleased at being stroked on the head and throat, and he frequently allowed me to touch his extremely sharp teeth. But his temper was always quick, and when he was unseasonably disturbed he expressed a little resentment, by an obscure murmur, like that of a squirrel. . . . When a grasshopper or any insect alighted within his reach, his eyes, as he fixed them on his prey, glowed with uncommon fire; and having drawn himself back to spring on his prey with greater force, he seized it with both his fore paws, and held it till he had devoured it. He never could have enough grasshoppers, and spent the whole night in prowling for them."

The SLENDER LORIS, an equally curious creature, is only found in Southern India and Ceylon. Its food consists entirely of insects, which it captures by gradual, almost paralysed approach. It has been described as a "furry-coated chameleon." A group of slow lemurs, living in Western Africa, are known as POTROS. They are odd little quadrupeds, in which the "forefinger" never grows to be more than a stump. The tail is also either sharp or rudimentary. They are as slow as the lorises in their movements.

In the Malay islands a distant relative, even more curiously formed, is found in the TARSIER. It has the huge eyes, pointed ears, and beautiful fur of the galagos, but the tail is long, thin and tufted. The fingers are flattened out into disks, like a tree-frog's. These creatures hop from bough to bough in a frog-like manner in search of insects. They are not so large as a good-sized rat. Our photograph does not give an adequate idea of the size of the eyes.

tion of many northern mammals. Tropical animals often become torpid to avoid the famine caused by the hot season, just as creatures in cold countries hibernate to avoid the hunger which would otherwise come with winter.

THE SLOW LEMURS OR LORISES, AND TARSIER

Another group of lemuroids is distinguished from the foregoing by having the second finger of the fore paws either very short or rudimentary. The thumb and great toe are also set very widely apart from the other fingers and toes. A far more striking distinction to the non-scientific eye is their astonishingly deliberate and slow movements. They have no tails, enormous eyes, and very long, slender legs.

The SLOW LORIS is found in Eastern India and the Malay countries, where it is fairly common in the forests. The Bengali natives call it *sharmindi billi* ("bashful cat"), from its slow, solemn, hesitating movements when in pursuit of insects. Of a slow loris kept by him, Sir William Jones, in the "Asiatic Researches," wrote: "At all times he seemed



Photo by L. Medland, F.Z.S.]

[North Finchley

SLOW LORIS

Another of the slow-moving loris group. These animals are not shown to the general public at the Zoo, but kept in a specially warmed room



Photo by A. S. Rudland & Sons

TARSIER

These little animals hop about in the trees like frogs. They are nocturnal, and seldom seen

tracting grubs and insects from the burrows in which they dwell, or the crannies in which they may have taken refuge. Very seldom is this animal seen alive in captivity. Although commonly called Aye-aye in this country, it is doubtful if this is really its native name. The aye-aye was long a puzzle to naturalists, but is now classed as a lemuroid.

THE living races of animals have thus far been reviewed along the completed list of the first great order—the Primates. Even in that circumscribed group how great is the tendency to depart from the main type, and how wonderful the adaptation to meet the various needs of the creatures' environment! The skeletons, the frames on which these various beings are built up, remain the same in character; but the differences of proportion in the limbs, of the muscles with which they are equipped, and of the weight of the bodies to be moved are astonishing. Compare, for instance, the head of the male Gorilla, with its great ridges of bone, to which are attached the muscles which enable it to devour hard tropical fruits and bite off young saplings and bamboos, with the rounded and delicate head of the Insect-eating Monkeys of South Africa; or set side by side the hand of the Chimpanzee with that of the Aye-aye, with its delicate, slender fingers, like those of a skeleton hand. What could be more diverse than the movements of these creatures, whose structure is nevertheless so much alike? Some of the lemuroids are as active as squirrels, flying lightly from branch to branch; in others, as the Slow Lorises, the power of rapid movement has disappeared, and been replaced by a creeping gait which cannot be accelerated. Already, in a single order, we see the rich diversity of nature, and its steady tendency to make all existing things serviceable by adapting other parts of creation to their use or enjoyment.

THE AYE-AYE

Last, and most remarkable of all these weird lemuroids, is the AYE-AYE. It is placed in a group by itself, and has teeth like those of the Rodents, a large bushy tail, and most extraordinarily long, slender fingers, which it probably uses for picking caterpillars and grubs out of rotten wood. It is nearly as large as an Arctic fox, but its habits are those of a lemur. In Madagascar it haunts the bamboo forests, feeding on the juice of sugar-cane, grubs, and insects. The fingers of its hands are of different sizes and lengths, though all are abnormally long and slender. The second finger seems to have "wasted," but is said to be of the utmost value to its owner in ex-

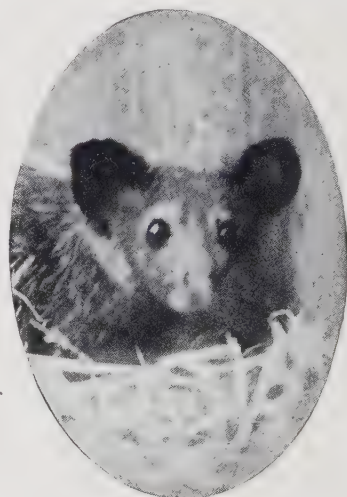


Photo by L. Medland, F.Z.S., N. Finchley

HEAD OF AYE-AYE

The aye-aye lives mainly in the wild sugar-cane groves, and feeds on insects and grubs, as well as on the juice of the sugar-cane



Photo by Charles Knight, Aldershot.

AFRICAN LION AND LIONESS.

These animals are so numerous in East Africa that they are exempted from protection.



Photo by Fratelli Alinari]

[Florence

AFRICAN LION

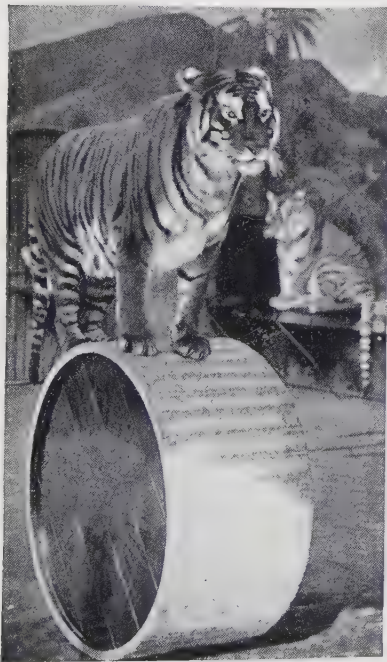
This lion is almost in the attitude of those sculptured by Sir Edwin Landseer for the Nelson Monument, but the feet are turned in, not lying flat

CHAPTER II

THE CAT TRIBE

THOUGH only one species is entirely domesticated, and none of the Cats have flesh edible by man, except perhaps the puma, no group of animals has attracted more interest than this. Containing more than forty species, ranging in size from the ox-devouring tiger or

lion to the small wild cats, they are so alike in habit and structure that no one could possibly mistake the type or go far wrong in guessing at the habits of any one of them. They are all flesh-eaters and destroyers of living animals. All have rounded heads, and an extraordinary equipment of teeth and of claws, and of muscles to use them. The blow of the forearm of a lion or tiger is inconceivably powerful, in proportion to its size. A stroke from a tiger's paw has been known to strike off a native's arm from the shoulder and leave it hanging by a piece of skin, and a similar blow from a lion to crush the skull of an ox. The true cats are known by the power to draw back, or "retract," their claws into sheaths of horn, rendering their footsteps noiseless, and keeping these weapons always sharp. The hunting-leopard has only a partial capacity for doing this.



By permission of Herr Carl Hagenbeck, Hamburg

AN UNWILLING PUPIL

This is one of Herr Hagenbeck's famous performing tigers

The characteristics of the Cats and their allies are too well known to need description. We will therefore only mention the chief types of the group, and proceed to give, in the fullest detail which space allows, authentic anecdotes of their life and habits. The tribe includes Lions, Tigers, Leopards, Pumas, Jaguars, a large number of so-called Tiger-cats (spotted and striped), Wild Cats, Domestic Cats, and Lynxes. The Hunting-leopard, or Cheetah, stands in a sub-group by itself, as does the Fossa, the only large carnivore of Madagascar.



Photo by York & Son]

[Notting Hill

LIONESS AROUSED

The pose of the animal here shows attention, but not anger or fear

This closes the list of the most cat-like animals. The next links in the chain are formed by the Civets and Genets, creatures with more or less retractile claws, and long, bushy tails; the still less cat-like Binturong, a creature with a prehensile tail; and the Mongooses and Ichneumons, more and more nearly resembling the weasel tribe.

THE LION

RECENT intrusions for railways, sport, discovery, and war into Central and East Africa have opened up new lion countries, and confirmed, in the most striking manner, the stories of the power, the prowess, and the dreadful destructiveness to man and beast of this king of the Carnivora. At present it is found in Persia, on the same rivers where Nimrod and the Assyrian kings made its pursuit their royal sport; in Gujerat, where it is nearly extinct, though in General Price's work on Indian game written before the middle of the last century it is stated that a cavalry officer

killed eighty lions in three years; and in Africa, from Algeria to the Bechuana country. It is especially common in Somaliland, where the modern lion-hunter mainly seeks his sport. On the Uganda Railway, from Mombasa to Lake Victoria, lions are very numerous and dangerous. In Rhodesia and the Northern Transvaal they have killed hunters, railway officials, and even our soldiers near Komati Poort. It has been found that whole tracts of country are still often deserted by their inhabitants from fear of lions, and that the accounts of their ravages contained in the Old Testament, telling how Samaria was almost deserted a second time from this cause, might be paralleled to-day.

THE AFRICAN LION

BY F. C. SELOUS

When, in the latter half of the seventeenth century, Europeans first settled at the Cape of Good Hope, the lion's roar was probably to be heard almost nightly on the slopes of Table Mountain, since a quaint entry in the Diary of Van Riebeck, the first Dutch governor of the Cape, runs thus: "This night the lions roared as if they would take the fort by storm"—the said fort being situated on the site of the city now known as Cape Town.

At that date there can be little doubt that, excepting in the waterless deserts and the dense equatorial forests, lions roamed over the whole of the vast continent of Africa from Cape Agulhas to the very shore of the Mediterranean Sea; nor was their range very seriously curtailed until the spread of European settlements in North and South Africa, and the acquisition of firearms by the aboriginal inhabitants of many parts of the country, during the latter half of the nineteenth century, steadily denuded large areas of all wild game.

As the game vanished, the lions disappeared too; for although at first they preyed to a large extent on the domestic flocks and herds which gradually replaced the wild denizens of the



Photo by M. Geiser]

[Algiers]

ALGERIAN LIONESS

This lioness, sitting under an olive-tree, was actually photographed in the Soudan by the intrepid M. Geiser



A FOSTER-MOTHER

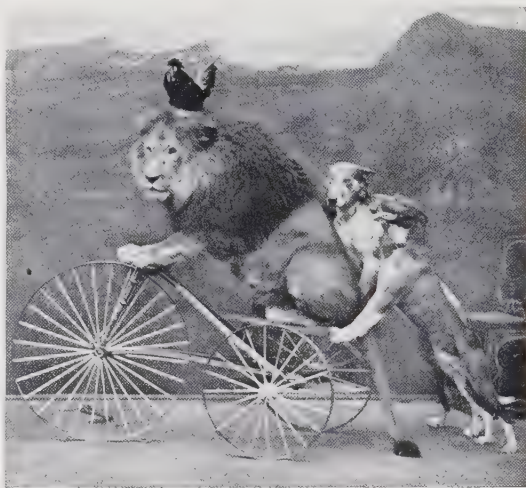
This is a remarkable photograph of a setter suckling three lion cubs which had lost their mother. It is reproduced here by permission of the Editor of the Irish Field

come so numerous in the sparsely inhabited or altogether uninhabited parts of Africa, that they would first have exterminated all the game on which they had been wont to prey, and would then have had to starve or to have eaten one another. But such a state of things has never been known to occur; and whenever Europeans have entered a previously unexplored and uninhabited tract of country in Africa, and have found it teeming with buffaloes, zebras, and antelopes, they have always found lions in such districts very plentiful indeed, but never in such numbers as to seriously diminish the abundance of the game upon which they depended for food.

once-uninhabited plains, this practice brought them into conflict with the white colonists or native herdsmen armed with weapons of precision, before whom they rapidly succumbed.

To-day lions are still to be found wherever game exists in any quantity, and their numbers will be in proportion to those of the wild animals on which they prey.

The indefinite increase of lions must be checked by some unknown law of nature, otherwise they would have be-



By permission of Herr Carl Hagenbeck]

[Hamburg

A PERFORMING LION

Lions, it would seem, are capable of being taught almost anything, even tricycle-riding

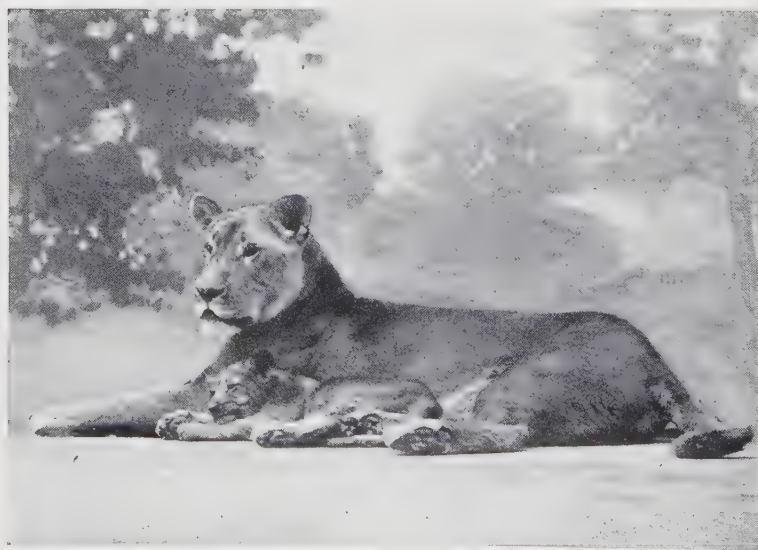


Photo by G. W. Wilson & Co., Ltd.]

[Aberdeen

LIONESS AND CUB

Lion cubs thrive both in Dublin and Amsterdam, but not so well at the London Zoo

It is easy to understand that the increase of a herd of herbivorous animals would be regulated by the amount of the food-supply available, as well as constantly checked by the attacks of the large carnivora, such as lions, leopards, cheetas, hyænas, and wild dogs; but I have never been able to comprehend what has kept within bounds the inordinate increase of lions and other carnivorous animals in countries where for ages past they have had an abundant food-supply, and at the same time, having

been almost entirely unmolested by human beings, have had no enemies. Perhaps such a state of things does not exist at the present day, but there are many parts of Africa where such conditions have existed from time immemorial up to within quite recent years.

Since lions were once to be found over the greater portion of the vast continent of Africa, it is self-evident that these animals are able to accommodate themselves to great variations of climate and surroundings; and I myself have met with them, close to the sea, in the hot and sultry coastlands of Southeast Africa; on the high plateau of Mashonaland, where at an altitude of 6,000 feet above sea-level the winter nights are cold and frosty; amongst the stony hills to the east of the Victoria Falls of the Zambesi; and in the swamps of the Chobi. In the great reed-beds of the latter river a certain number of lions appeared to live constantly, preying on buffaloes



Photo by Fratelli Alinari]

[Florence

A YOUNG LIONESS

The sole of the hind foot shows the soft pads on which the Cats noiselessly approach their prey

and lechwe antelopes. I often heard them roaring at nights in these swamps, and I once saw two big male lions wading slowly across an open space between two beds of reeds in water nearly a foot in depth.

Although there are great individual differences in lions as regards size, general colour of coat, and more particularly in the length, colour, and profuseness of the mane with which the males are adorned, yet as these differences occur in every part of Africa where lions are met with, and since constant varieties with one fixed type of mane living by themselves and not interbreeding with other varieties do not exist anywhere, modern zoologists are, I think, now agreed that there is only one species of lion, since in any large series of wild lion skins, made in any particular district of Africa or Asia, every gradation will be found between the finest-maned specimens and those which are destitute of any mane at all. Several local races have, however, been recently described by German writers.

In the hot and steamy coastlands of tropical Africa lions usually have short manes, and never, I believe, attain the long silky black manes sometimes met with on the high plateaux of the interior. However, there is, I believe, no part of Africa where all or even the majority



By permission of Herr Carl Hagenbeck]

[Hamburg

A HAPPY FAMILY

Here is a group of animals and their keeper from Herr Hagenbeck's Tierpark. The animal in front is a cross between a lion and a tigress; he lives on quite friendly terms with his keeper, and also with lions, tigers, and leopards, as seen in the photograph

of hair in each flank just where the thighs join the belly; but I have never yet seen the skin of a lion shot within the last thirty years with the whole belly covered with long, thick hair, as may constantly be observed in lions kept in captivity in menageries. There is, however, some evidence to show that, when lions existed on the high plains of the Cape Colony and the Orange River Colony, where the winter nights are much colder than in the countries farther north where lions may still be encountered, certain individuals of the species developed a growth of long hair all over the belly, as well as an extraordinary luxuriance of mane on the neck and shoulders.

From the foregoing remarks it will be seen that wild lions, having as a rule much less luxuriant manes than many examples of their kind to be seen in European menageries, are ordinarily not so majestic and dignified in appearance as many of their caged relatives. On the other hand, the wild lion is a much more alert and active animal than a menagerie specimen, and when in good condition is far better built and more powerful-looking, being free from all appearance of lankiness and weakness in the legs, and having strong, well-formed hindquarters. The eyes of the menagerie lion, too, look brown and usually sleepy, whilst those of the wild animal are yellow, and extraordinarily luminous even after death. When wounded and standing

of male lions carry heavy manes, the long hair of which does not as a rule cover more than the neck and chest, with a tag of varying length and thickness extending from the back of the neck to between the shoulder-blades. Lions with very full black manes, covering the whole shoulders, are rare anywhere, but more likely to be encountered on the high plateaux, where the winter nights are extremely cold, than anywhere else. In such cases, in addition to the tufts of hair always found on the elbows and in the armpits of lions with fair-sized manes, there will probably be large tufts



By permission of Herr Carl Hagenbeck]

[Hamburg

A CROSS BETWEEN LION AND TIGRESS

This unique photograph shows a remarkable hybrid and its proud parents. The father (on the right) is a lion, and the mother (on the left) a tigress. The offspring (in the centre) is a fine, large male, now four years old; it is bigger than an average-sized lion or tiger



Photo by Ottomar Anschütz

[Berlin]

A HUNGRY LION

Notice that the mane, as in most wild lions, is very scanty



By permission of Herr Carl Hagenbeck

[Hamburg]

LIONESS AND TIGER

The straightness of the lion's tail is here shown. It is not in the least like that of the tiger or of the cat

at bay, with head held low between his shoulders, growling hoarsely, and with twitching tail, even if he is not near enough to be observed very closely, a lion looks a very savage and dangerous animal; but should he be wounded in such a way as to admit of a near approach—perhaps by a shot that has paralyzed his hind-quarters—his flaming eyes will seem to throw out sparks of living fire.

Speaking generally, there is little or no danger in meeting a lion or lions in the daytime. Even in parts of the country where firearms are unknown, and

where the natives seldom or never interfere with them, these animals seem to have an instinctive fear of man, and even when encountered at the carcase of an animal freshly killed, and at a time when they may be supposed to be hungry, they will almost invariably retreat before the unwelcome presence, sometimes slowly and sulkily, but in districts where much hunting with firearms has been going on at a very rapid pace. However, I have known of two cases of Europeans mounted on horseback having been attacked by lions in broad daylight, and Dr. Livingstone mentions a third. In one of the instances which came within my own knowledge, a lion sprang at a Boer hunter as he was riding slowly along, carrying an elephant-gun in his right hand and followed by a string of natives on foot. The lion attacked from the left side, and with its right paw seized my friend from behind by the right side of his face and neck, inflicting deep gashes with its sharp claws, one of which cut right through his cheek and tore out one of his teeth. My friend was pulled from his horse, but, clutching the loosely girthed saddle tightly with his knees, it twisted round under the horse's belly before he fell to the ground. Instead of following up its success, the lion, probably scared by the shouting of the Kaffirs, trotted away for a short distance, and then turned and stood looking at the dismounted hunter, who, never having lost his presence of mind, immediately shot it dead with his heavy old muzzle-loading elephant-gun. Besides these three instances of Europeans having been attacked in the daytime by lions, I have known of a certain number of natives having been killed in broad daylight. Such incidents are, however, by no means every-day occurrences, and, speaking generally, it may be said that the risk of molestation by lions in Africa during daylight is very small. It is by night that lions roam abroad with stealthy step in search of prey; and at such times they are often, when hungry, incredibly bold and daring. I have known them upon several occasions to enter a hunter's camp, and, regardless of fires, to seize oxen and horses and human beings.

During the year following the first occupation of Mashonaland in 1890, a great deal of damage was done by lions, which could not resist the attractions of the settlers' live stock. For the first few months I kept as accurate an account as I could of the number of horses, donkeys,

oxen, sheep, goats, and pigs which were killed by lions, and it soon mounted up to over 200 head. During the same time several white men were also mauled by lions, and one unfortunate man named Teale was dragged from beneath the cart, where he was sleeping by the side of a native driver, and at once killed and eaten. Several of the horses were killed inside rough shelters serving as stables. In the following year (1891) over 100 pigs were killed in one night by a single lioness. These pigs were in a series of pens, separated one from another, but all under one low thatched roof. The lioness forced her way in between two poles, and apparently was unable, after having satisfied her hunger, to find her way out again, and, becoming angry and frightened, wandered backwards and forwards through the pens, killing almost all the pigs, each one with a bite at the back of the head or neck. This lioness, which had only eaten portions of two young pigs, made her escape before daylight, but was killed with a set gun the next night by the owner of the pigs.

When lions grow old, they are always liable to become man-eaters. Finding their strength failing them, and being no longer able to hunt and pull down large antelopes or zebras, they are driven by hunger to killing small animals, such as porcupines, and even tortoises, or they may visit a native village and catch a goat, or kill a child or woman going for water; and finding a human being a very easy animal to catch and kill, an old lion which has once tasted human flesh will in all probability continue to be a man-eater until he is killed. On this subject, in his "Missionary Travels," Dr. Livingstone says: "A man-eater is invariably an old lion; and when he overcomes his fear of man so far as to come to villages for goats, the people remark, 'His teeth are worn; he will soon kill men.' They at once acknowledge the necessity of instant action, and turn out to kill him." It is the promptness with which measures are taken by the



Photo by Ottomar Anschütz

[Berlin]

TIGRESS

Were the grass seen here the normal height of that in the Indian jungles, the upright lines would harmonise with the stripes, and render the tiger almost invisible



Photo by L. Medland, F.Z.S., North Finchley

TIGER CUB

Note the great development of the legs and paws

TIGERS are the "type animal" of Asia. They are found nowhere else. Lions were inhabitants, even in historic times, of Europe, and are still common on the Euphrates and in parts of Persia, just as they were when the Assyrian kings shot them with arrows from their hunting-chariots. They survived in Greece far later than the days when story says that Hercules slew the Nemean lion in the Peloponnesus, for the baggage-animals of Xerxes' army of invasion were attacked by lions near Mount Athos. But the tiger never comes, and never did come in historic times, nearer to Europe than the Caucasian side of the Caspian Sea. On the other hand, they range very far north. All our tiger-lore is Indian. There is scarcely a story of tigers to be found in English books of sport which deals with the animal north of the line of the Himalaya. These Chinese northern tigers and the Siberian tigers are far larger than those of India. They have long woolly coats, in order to resist the cold. Their skins are brought to market in hundreds every year to the great fur-sales. But the animals themselves we never see. The present writer was informed by a friend that in the Amur

greater part of the natives of Southern Africa to put an end to any lion which may take to eating men that prevents these animals as a rule from becoming the formidable pests which man-eating tigers appear to be in parts of India. But man-eating lions in Africa are not invariably old animals. One which killed thirty-seven human beings in 1887, on the Majili River, to the north-west of the Victoria Falls of the Zambesi, was, when at last he was killed, found to be an animal in the prime of life; whilst the celebrated man-eaters of the Tsavo River, in East Africa, were also apparently strong, healthy animals. These two man-eating lions caused such consternation amongst the Indian workmen on the Uganda Railway that the work of construction was considerably retarded, the helpless coolies refusing to remain any longer in a country where they were liable to be eaten on any night by a man-eating lion. Both these lions were at last shot by one of the engineers on the railway (Mr. J. H. Patterson), but not before they had killed and devoured twenty-eight Indian coolies and an unknown number of native Africans.

THE TIGER



Photo by Valentine & Sons, Ltd.,

A ROYAL TIGER

This is an old Bengal Tiger, with the smooth, short coat grown in that hot climate

[Dundee]



Photo by Fratelli Alinari]

[Florence]

A TIGER BEFORE SLEEPING

Tigers, when about to sleep, sit in this position; when more drowsy, they lie down or roll over on their backs

Valley he shot three of these tigers in a day, putting them up in thick bush-scrub by the aid of dogs.

The ROYAL BENGAL TIGER, so called, and very properly called in the old books of natural history, is a different and far more savage beast. It is almost *invariably* a ferocious savage, fierce by nature, never wishing to be otherwise than a destroyer—of beasts mainly, but often of men. Compared with the lion, it is far longer, but rather lighter, for the lion is more massive and compact. “A well-grown tigress,” says Sir Samuel Baker, “may weigh on an average 240 lbs. live weight. A very fine tiger may weigh 440 lbs., but if fat the same tiger would weigh 500 lbs. There may be tigers which weigh 50 lbs. more than this; but I speak according to my experience. I have found that a tiger of 9 feet 8 inches is about 2 inches above the average. The same skin may be *stretched* to measure 10 feet. A tiger in the Zoological Gardens is a long, lithe creature with little flesh. Such a specimen affords a poor example of this grand animal in its native jungles, with muscles in their full, ponderous development from continual exertion in nightly travels over long distances, and in mortal struggles when wrestling with its prey. A well-fed tiger is by no means a slim figure. On the contrary, it is exceedingly bulky, broad in the shoulders, back, and loins, and with an extraordinary girth of limbs, especially in the forearms and wrists.”

This ponderous, active, and formidably armed creature is, as might be expected, able to hold its own wherever Europeans do not form part of the regular population. In India the peasants are quite helpless even against a cattle-killing tiger in a populous part of the country. In the large jungles, and on the islands at the mouths of the great rivers, the tigers have things all their own way. Things are no better in the Far East. A large peninsula near Singapore is said to

have been almost abandoned by its cultivators lately, owing to the loss of life caused by the tigers. In the populous parts of India the tiger is far more stealthy than in the out-of-the-way districts. It only hunts by night; and after eating a part of the animal killed, moves off to a distance, and does not return. Otherwise the regular habit is to return to the kill just at or after dusk, and finish the remainder. Its suspicions seem quite lulled to sleep after dark. Quite recently a sportsman sat up to watch for a tiger at a water-hole. It was in the height of the Indian hot season, when very little water was left. All the creatures of that particular neighbourhood were in the habit of coming to drink at one good pool still left in the rocky bed of the river. There the tigers came too. The first night they did not come until all the other creatures—hog, deer, peacocks, and monkeys—had been down to drink. They then came so softly over the sand that the gunner in waiting did not hear them pass. His first knowledge that they were there was due to the splashing they made as they entered the water. It was quite dark, and he felt not a little nervous, for the bush on which he was seated on a small platform was only some 10 feet high. He heard the two tigers pass him, not by their footsteps, but by the dripping of



Photo by Scholastic Photo, Co.]

[Parson's Green

A HALF-GROWN TIGER CUB

Tigers "grow to their head," like children. The head of a half-grown cub is as long, though not so broad, as that of the adult

the water as it ran off their bodies on to the sand. Next night they came again. This time, though it was dark, he shot one in a very ingenious manner. The two tigers walked into the water, and apparently lay down or sat down in it, with their heads out. They only moved occasionally, lapping the water, but did not greatly disturb the surface. On this was reflected a bright star from the sky above. The sportsman put the sight of the rifle on the star, and kept it up to his shoulder. Something obliterated the star, and he instantly fired. The "something" was the tiger's head, which the bullet duly hit.

The hill-tigers of India are, or were, much more given to hunting by day than the jungle-tigers. In the Nilgiri Hills of Southern India the late General Douglas Hamilton said that before night the tigers were already about hunting, and that in the shade of evening it was dangerous to ride on a pony—not because the tigers wished to kill the rider, but because they might mistake the pony and its rider for a sambar deer. He was stalked like this more than once. Often, when stalking sambar deer and ibex by day, he saw the tigers doing the same, or after other prey. "My brother Richard," he writes, "was out after a tiger which the hillmen reported had killed a buffalo about an hour before. He saw the tiger on first getting to the ground, and the tiger had seen him. It was lying out in the open watching the buffalo, and shuffled into the wood, and would not come out again. Next morning, when we got to the ground, the tiger was moving from rock to rock, and had dragged the body into a nullah. . . . We were upon the point of starting home when we observed a number of vultures coming down to the carcass. The vultures began to collect in large numbers on the opposite hill. I soon counted fifty; but they would not go near the buffalo. Then some crows, bolder than the rest, flew down, and



Photo by Fratelli Alinari]

[Florence

TIGERS IN ITALY

These tigers were photographed in Turin. Italy was the first European country to which these animals were brought from the East

made a great row over their meal. All of a sudden they all flew up, and I made certain it was the tiger. Then my brother fired, and there he was, shot right through the brain, lying just above the buffalo. He had been brought down by the noise the crows were making. Upon driving the *sholas* (small woods on these hills), tigers were often put out. Sometimes they availed themselves of the drive to secure food for themselves. A wood was being driven, when a tremendous grunting was heard, and out rushed an old boar, bristling and savage. B—— was about to raise his rifle, when a growl like thunder stopped him, and a great tiger with one spring cleared the nullah, and alighted on the back of the old boar. Such a battle then took place that, what with the growls of the tiger and the squeals of the boar, one might believe oneself in another world. I thought of nothing but of how to kill one or the other, or both; so, as they were rolling down over and over, about fifty yards from me on the open hillside, I let fly both barrels. For a second or two the noise went on; then the tiger jumped off, and the boar struggled into the nullah close by. The tiger pulled up, and coolly stared at us without moving; but his courage seemed to fail him, and he sprang into the nullah and disappeared."

In most parts of India tigers are now scarce and shy, except in the preserves of the great rajas, and the dominions of some mighty and pious Hindu potentates, such as the Maharaja of Jeypur, who, being supposed to be descended from a Hindu god, allows no wild animals to be killed. There the deer and pig are so numerous that tigers are welcome to keep them down. But the Sunderbunds, unwholesome islands at the Ganges mouth, still swarm with them. So does the Malay Peninsula.

Mr. J. D. Cobbold shot a tiger in Central Asia in a swamp so deep in snow and so deadly cold that he dared not stay for fear of being frozen to death. Tigers sometimes wander as far west as the Caucasus near the Caspian. The farther north, the larger your tiger, is the rule. The biggest ever seen in Europe was a Siberian tiger owned by Herr Carl Hagenbeck, of Hamburg, and the largest known skin and skull is from the Far North. The skin is 13 feet 6 inches from the nose to the end of the tail. The



By permission of Herr Carl Hagenbeck]

A LEOPARD-PUMA HYBRID

This is a photograph from life of a very rare hybrid. The animal's father was a puma, its mother a leopard. It is now dead, and may be seen stuffed in Mr. Rothschild's Museum at Tring

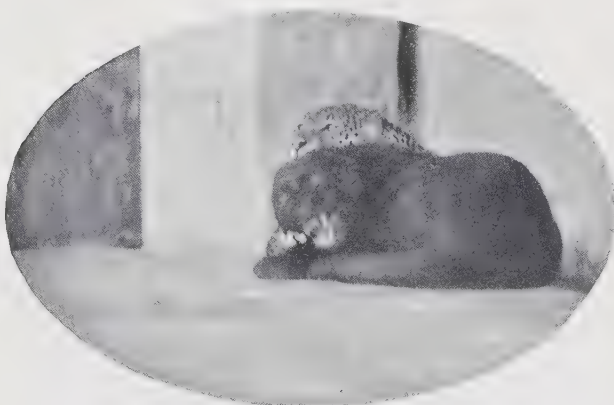


Photo by L. Medland, F.Z.S.]

[North Finchley

LEOPARDS

A pair of leopards, one spotted, the other black. Black leopards may be the offspring of the ordinary spotted form; they are generally much more savage

largest Indian tiger-skin, from one killed by the Maharaja of Cuch Behar, measures 11 feet 7 inches.

LEOPARDS

LESS in size, but even more ferocious, the LEOPARD has a worse character than the tiger. Living mainly in trees, and very nocturnal, this fierce and dangerous beast is less often seen than far rarer animals. It is widely spread over the world, from the Cape of Good Hope to the Atlas Mountains, and from Southern China to the Black Sea, where it is sometimes met with in the Caucasus. There seems to be no legend of its presence in Greece, Italy, or Spain; but it was quite common in Asia Minor; and Cicero, when governor of Cilicia, was plagued by an aristocratic young friend in Rome to send him leopards to exhibit in a *fête* he was giving.

Any one who has frequented the Zoo for any time must have noticed the difference in size and colour between leopards from different parts of the world. On some the ground-colour is almost white, in others a clear nut-brown. Others are jet-black. Wherever they live, they are cattle thieves, sheep thieves, and dog thieves. Though not formidable in appearance, they are immensely strong. Sometimes one will turn man-eater. Both in India and lately in Africa cases have been known where they have "set up" in this line as deliberately as any tiger. They have four or five young at a birth, which may often be kept tame for some time and are amusing pets. But the following plain story shows the danger of such experiments. At Hongkong an English merchant had a tame leopard, which was brought into the room by a coolie for the guests to see at a dinner party. Excited by the smell of food, it refused to go out when one of the ladies, who did not like its looks, wished for it to be removed. The man took hold of its collar and began to haul it out. It seized him by the neck, bit it through, and in a minute the coolie was dying, covered with blood, on the dining-room floor!

The Chinese leopard ranges as far north as the Siberian tiger, and, like the latter, seems to grow larger the farther north it is found. The colour of these northern leopards is very



Photo by C. Reid]

[Wishaw, N. B.]

A YOUNG LEOPARD

The leopard cub is far more cat-like in appearance than the young tiger or lion

pale, the spots large, and the fur very long. At the March fur-sales of the present year, held at the stores of Sir Charles Lampson, there were Siberian leopard-skins as large as those of a small tiger.

Leopards are essentially tree-living and nocturnal animals. Sleeping in trees or caves by day, they are seldom disturbed. They do an incredible amount of mischief among cattle, calves, sheep, and dogs, being especially fond of killing and eating the latter. They seize their prey by the throat, and cling with their claws until they succeed in breaking the spine or in strangling the victim. The largest leopards are popularly called PANTHERS. In India they sometimes become man-eaters, and are always very dangerous. They have a habit of feeding on putrid flesh; this makes wounds inflicted by their teeth or claws liable to blood-poisoning. Nothing in the way of prey comes amiss to them, from a cow in the pasture to a fowl up at roost. "In every country," says Sir Samuel Baker, "the natives are unanimous in saying that the leopard is more dangerous than the lion or tiger.

Wherever I have been in Africa, the natives have declared that they had no fear of a lion, provided they were not hunting, for it would not attack unprovoked, but that a leopard was never to be trusted. I remember when a native boy, accompanied by his grown-up brother, was busily employed with others in firing the reeds on the opposite bank of a small stream. Being

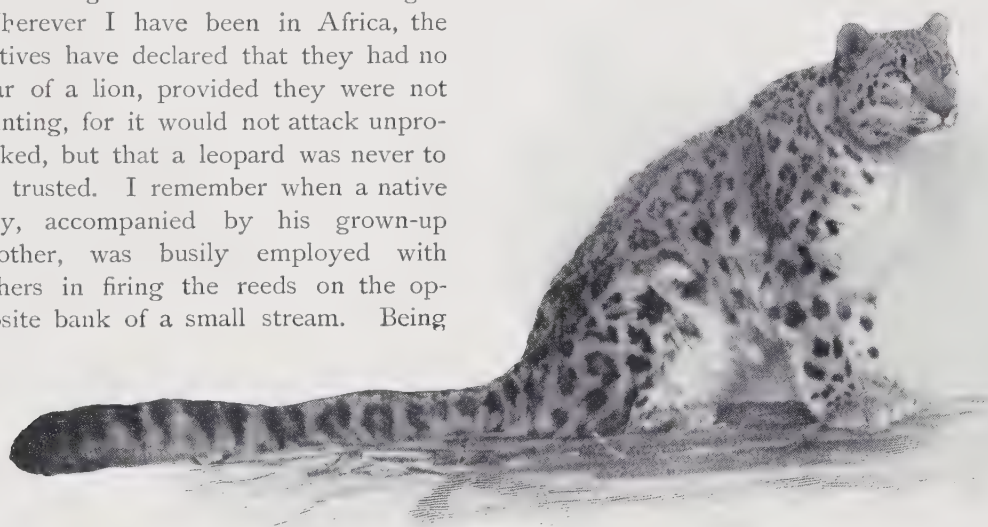


Photo by J. W. McLellan

[Highbury

SNOW-LEOPARD, OR OUNCE

This is a striking portrait of a very beautiful animal. Note the long bushy tail, thick coat, and large eyes

thirsty and hot, the boy stooped down to drink, when he was immediately seized by a leopard. His brother, with admirable aim, hurled his spear at the leopard while the boy was in his jaws. The point separated the vertebrae of the neck, and the leopard fell stone-dead. The boy was carried to my hut, but there was no chance of recovery. The fangs had torn open the chest and injured the lungs. These were exposed to view through the cavity of the ribs. He died the same night."

In the great mountain-ranges of Central Asia the beautiful SNOW-LEOPARD is found. It is a large creature, with thick, woolly coat, and a long tail like a fur boa. The colour is white, clouded with beautiful gray, like that of an Angora cat. The edges of the cloudings and spots are marked with black or darker gray. The eyes are very large, bluish gray or smoke-coloured. It lives on the wild sheep, ibex, and other mountain animals. In captivity it is far the tamest and gentlest of the large carnivora, not excepting the puma. Unlike the latter, it is a sleepy, quiet animal, like a domestic cat. The specimen shown here belonged to a lady in India, who kept it for some time as a pet. It was then brought to the Zoological Gardens, where it was more amiable and friendly than most cats. The writer has entered its cage with the keeper, stroked it, and patted its head, without in the least ruffling its good-temper. The heat of the lion-house did not suit it, and it died of consumption.



Photo by Ottomar Anschütz.]

[Berlin

CHEETA

A cheeta is a hunting-leopard; this one is a particularly large specimen. The cheetas are dealt with later on in this chapter



Photo by G. W. Wilson & Co., Ltd.]

[Aberdeen]

JAGUAR

The largest and strongest of the Cats of America. A South American species

THE AMERICAN CATS

THE cats, great and small, of the New World resemble those of the Old, though not quite so closely as the caribou, wapiti deer, and moose of the northern forests resemble the reindeer, red deer, and elk of Europe. They are like, but with a difference. The Jaguar and the Ocelot are respectively larger and far more beautiful than their counterparts, the leopard and serval cats. But the Puma, the one medium-sized feline animal which is unspotted, is something unique. The jaguar and puma are found very far south in South America; and though the jaguar is really a forest animal, it seems to have wandered out on to the Pampas of Argentina, perhaps attracted by the immense numbers of cattle, sheep, and horses on these plains.

THE JAGUAR

The JAGUAR is as savage as it is formidable, but does not often attack men. Its headquarters are the immense forests running from Central America to Southern Brazil; and as all great forests are little inhabited, the jaguar is seldom encountered by white men. By the banks of the great rivers it is semi-aquatic; it swims and climbs with equal ease, and will attack animals on board boats anchored in the rivers. As there are few animals of great size in these forests, its great strength is not often seen exercised, as is that of the lion; but it is the personification of concentrated force, and its appearance is well worth studying from that point of view. The spots are larger and squarer than in the leopard, the head ponderous, the forearms and feet one mass of muscle, knotted under the velvet skin. On the Amazons it draws its food alike from the highest tree-tops and the river-bed; in the former it catches monkeys in the branches, fish in the shallows of the rivers, and scoops out turtles' eggs from the sand banks. Humboldt, who visited these regions when the white population

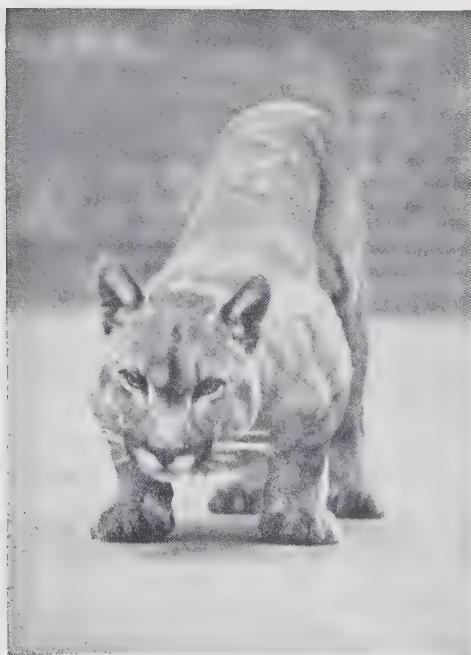


Photo by Scholastic Photo. Co., Parson's Green

PUMA

A puma in the act of lying down, like a domestic cat

was scarce, declared that 4,000 jaguars were killed annually, and 2,000 skins exported from Buenos Ayres alone. It was clearly common on the Pampas in his day, and made as great havoc among the cattle and horses as it does to-day.

THE PUMA

The PUMA is a far more interesting creature. It is found from the mountains in Montana, next the Canadian boundary, to the south of Patagonia. Many stories of its ferocity may have some foundation; but the writer believes there is no recorded instance of the northern puma attacking man unprovoked, though in the few places where it now survives it kills cattle-calves and colts. It is relentlessly hunted with dogs, treed, and shot. As to the puma of the



Photo by Ottomar Anschütz

[Berlin]

FEMALE PUMA

This shows a puma alert and vigilant, with ears pricked forward

southern plains and central forests, the natives, whether Indians or Gauchos, agree with the belief, steadily handed down from the days of the first Spanish conquest, that the puma is the one wild cat which is naturally friendly to man. The old Spaniards called it *amigo del Cristiano* (the Christian's friend); and Mr. Hudson, in "The Naturalist in La Plata," gives much evidence of this most curious and interesting tendency: "It is notorious that where the puma is the only large beast of prey it is perfectly safe for a small child to go out and sleep on the plain. . . . The puma is always at heart a kitten, taking unmeasured delight in its frolics; and when, as often happens, one lives alone in the desert, it will amuse itself for hours fighting mock battles or playing hide-and-seek with imaginary companions, or lying in wait and putting all its wonderful strategy in practice to capture a passing butterfly." From Azara downwards these stories have been told too often not to be largely true; and in old natural histories, whose



Photo by Ottomar Anschütz

[Berlin]

OCELOT

Note the elongated spots, and their arrangement in chains

writers believed the puma was a terrible man-eater, they also appear as "wonderful escapes." One tells how a man put his *poncho*, or cloak, over his back when crawling up to get a shot at some duck, and felt something heavy on the end of it. He crept from under it, and there was a puma sitting on it, which did not offer to hurt him.

As space forbids further quotation from Mr. Hudson's experiences, which should be read, the writer will only add one anecdote which was told him by Mr. Everard im Thurn, C. B., formerly an official in British Guiana. He was going up one of the big rivers in his steam-launch, and gave a passage to an elderly and respectable Cornish miner, who wanted to go up to a gold-mine. The visitor had his meals on the boat, but at night went ashore with the men and slung his hammock between two trees, leaving the cabin to his

host. One morning two of the Indian crew brought the miner's hammock on board with a good deal of laughing and talking. Their master asked what the joke was, whereupon, pointing to the trees whence they had unslung the hammock, one said, "Tiger sleep with old man last night." They were quite in earnest, and pointed out a hollow and marks on the leaves, which showed that a puma had been lying *just under the man's hammock*. When asked if he had noticed anything in the night, he said, "Only the frogs croaking wakened me up." The croaking of the frogs was probably the hoarse purring of the friendly puma enjoying his proximity to a sleeping man. Mr. Hudson quotes a case in which four pumas played round and leapt over a person camping out on the Pampas. He watched them for some time, and then went to sleep! Many of those brought to this country come with their tempers ruined by ill-treatment and hardship; but a large proportion are as tame as cats. Captain Marshall had one at Marlow which used to follow him on a chain and watch the boats full of pleasure-seekers at the lock.

The puma is always a beautiful creature,—the fur cinnamon-coloured, tinged with gold; the belly and chest white; the tail long, full, and round. Though friendly to man, it is a desperate cattle-killer, and particularly fond of horse-flesh, so much so that it has been suggested that the indigenous wild horses of America were destroyed by the puma.

There are two other cats of the Pampas—the GRASS-CAT, not unlike our wild cat in appearance and habits, and the WOOD-CAT, or Geoffroy's Cat. It is a tabby, and a most elegant creature, of which there is a specimen, at the time of writing, in the Zoo.

THE OCELOT

In the forest region is also found the most beautiful of the medium-sized cats. This is the



Photo by Ottomar Anschütz, Berlin.

OCELOT FROM CENTRAL AMERICA.

This is one of the most beautifully marked of all Mammals. The ornamental colouring is seldom quite the same in any two specimens.

OCELOT, which corresponds somewhat to the servals, but is not the least like a lynx, as the servals are. It is entirely a tree-cat, and lives on birds and monkeys. The following detailed description of its coloration appeared in "Life at the Zoo":—

"Its coat, with the exception perhaps of that of the clouded leopard of Sumatra, marks the highest development of ornament among four-footed animals. The Argus pheasant alone seems to offer a parallel to the beauties of the ocelot's fur, especially in the development of the wonderful ocelli, which, though never reaching in the beast the perfect cup-and-ball ornament seen on the wings of the bird, can be traced in all the early stages of spots and wavy lines, so far as the irregular shell-shaped rim and dot on the feet, sides, and back, just as in the subsidiary ornament of the Argus pheasant's feathers. Most of the ground-tint of the fur is



Photo by Ottomar Anschütz

[Berlin]

OCELOT FROM CENTRAL AMERICA

The ocelot can be tamed and almost domesticated if taken young, and is occasionally kept as a pet by the forest Indians

smoky-pearl colour, on which the spots develop from mere dots on the legs and speckles on the feet and toes to large egg-shaped ocelli on the flanks. There are also two beautiful pearl-coloured spots on the back of each ear, like those which form the common ornaments of the wings of many moths."

The nose is pink; the eye large, convex, and translucent.

A tame ocelot described by Wilson, the American naturalist, was most playful and affectionate, but when fed with flesh was less tractable. It jumped on to the back of a horse in the stable, and tried to curl up on its hindquarters. The horse threw the ocelot off and kicked it, curing it of any disposition to ride. On seeing a horse, the ocelot always ran off to its kennel afterwards. When sent to England, it caught hold of and threw down a child of four years old, whom it rolled about with its paws without hurting it.

OTHER WILD CATS

A HANDSOME leopard-like animal is the CLOUDED LEOPARD. It is the size of a small common leopard, but far gentler in disposition. Its fur is not spotted, but marked with clouded patches, outlined in gray and olive-brown. Its skin is among the most beautiful of the Cats. It is found in the Malay Peninsula, Borneo, Sumatra, Formosa, and along the foot of the Himalaya from Nepal to Assam. Writing of two which he kept, Sir Stamford Raffles said: "No kitten could be more good-tempered. They were always courting intercourse with persons passing by, and in the expression of their countenance showed the greatest delight when noticed, throwing themselves on their backs, and delighting in

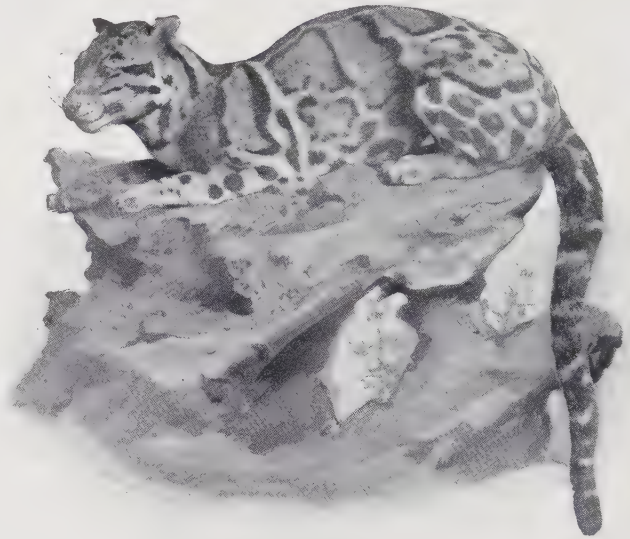


Photo by A. S. Rudland & Sons

CLOUDED LEOPARD

It shares with the ocelot the first place among the highly ornamented cats

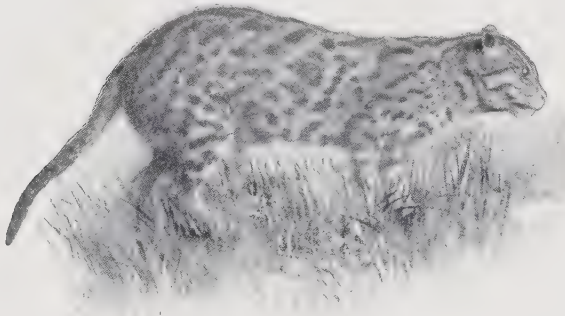


Photo by A. S. Rudland & Sons

FISHING-CAT

This wild cat haunts the sides of rivers, and is an expert at catching fish

gray and spotted, and those which are gray and striped, or "whole-coloured." There is no wholly gray wild cat, but several sandy-coloured species. All live on birds and small mammals, and probably most share the tame cat's liking for fish. Among the gray-and-spotted cats are the MOTTLED CAT of the Eastern Himalaya and Straits Settlements and islands; the TIBETAN TIGER-CAT; the FISHING-CAT of India and Ceylon, which is large enough to kill lambs, but lives much on fish and large marsh-snails; GEOFFROY'S CAT, an American species; the LEOPARD-CAT of Java and Japan, which seems to have gray fur in

being tickled and rubbed. On board ship there was a small dog, which used to play around the cage with the animal. It was amusing to watch the tenderness and playfulness with which the latter came in contact with its smaller-sized companion." Both specimens were procured from the banks of the Bencoolin River, in Sumatra. They are generally found near villages, and are not dreaded by the natives, except in so far that they destroy their poultry.

The number of smaller leopard-cats and tiger-cats is very great. They fall, roughly, into three groups: those which are yellow and spotted, those which are

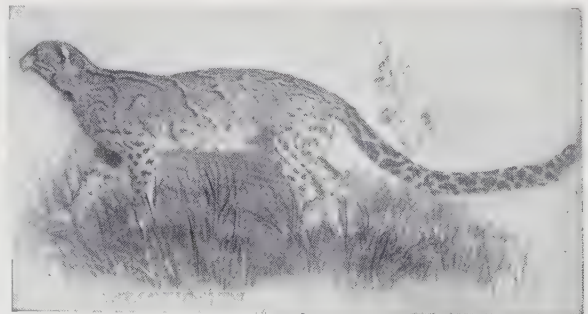


Photo by A. S. Rudland & Sons

MARBLED CAT

Another beautifully marked cat. The tail is spotted and very long, the marbled markings being on the body only



Photo by Ottomar Anschütz]

GOLDEN CAT

Sumatra is the home of this very beautifully coloured cat. The general tint is that of gold-stone. Sometimes the belly is pure white



Photo by A. S. Rudland & Sons

PAMPAS-CAT

Note the likeness of the thick tail and barred legs to the English wild cat.
"Inexpressibly savage in disposition" (Hudson)

most beautiful is the GOLDEN CAT of Sumatra, one of which is now in the Zoological Gardens. It has a coat the colour of gold-stone. The nose is pink, the eyes large and topaz-coloured, the cheeks striped with white, and the underparts and lower part of the tail pure white.

Four kinds of wild cats are known in South Africa, of which the largest is the SERVAL, a short-tailed, spotted animal, with rather more woolly fur than the leopard's. The length is about 4 feet 2 inches, of which the tail is only 12 inches. It is found from Algeria to the Cape; but its favourite haunts, like those of all the wild cats of hot countries, are in the reeds by rivers. It kills hares,



Photo by A. S. Rudland & Sons

BAY CAT

Japan and a fulvous leopard-like skin in India, where it is also called the TIGER-CAT; and the smallest of all wild cats, the little RUSTY-SPOTTED CAT of India. This has rusty spots on a gray ground. "I had a kitten brought to me," says Dr. Jerdon of the species, "when very young. It became quite tame, and was the delight and admiration of all who saw it. When it was about eight months old, I introduced the fawn of a gazelle into the room where it was. The little creature flew at it the moment it saw it, seized it by the nape of the neck, and was with difficulty taken off." Of the whole-coloured wild cats—which include the BAY CAT, the American PAMPAS-CAT, PALLAS' CAT of Tibet and India—the



Photo by A. S. Rudland & Sons

EYRA CAT

The lowest and longest of the cats, shaped more like a civet; it is readily tamed, and makes a charming pet

rats, birds, and small mammals generally.

The BLACK-FOOTED WILD CAT is another African species. It is a beautiful spotted-and-lined tabby, the size of a small domestic cat, and as likely as any other to be the origin of our tabby variety, if tame cats came to Europe from Africa. At present it is only found south in the Kalahari Desert and Bechuanaland.

The KAFFIR CAT is the common wild cat of the Cape Colony, and a very interesting animal. It is a whole-coloured tawny, upstanding animal, with all the indifference to man and generally independent character of the domestic tom-cat.

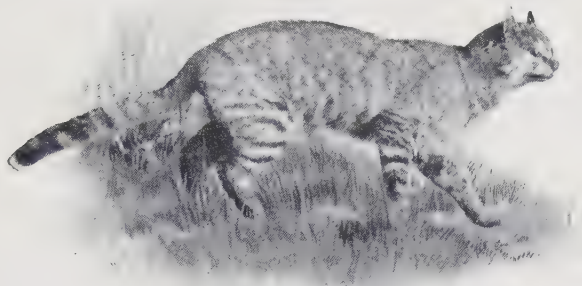


Photo by A. S. Rudland & Son

KAFFIR CAT

The common wild cat of South Africa. It will interbreed with domestic cats

chaus has only one distinctly marked; the Kaffir cat has four or five. The EGYPTIAN FETTERED CAT has been said to be the origin of the domestic and sacred cats of Egypt. A male chaus is most formidable when "cornered." General Hamilton chased one, which had prowled into the cantonments on the lookout for fowls, into a fence. "After a long time I spied the cat squatting in a hedge," he writes, "and called for the dogs. When they came, I knelt down and began clapping my hands and cheering them on. The cat suddenly made a clean spring at my face. I had just time to catch it as one would a cricket-ball, and, giving its ribs a strong squeeze, threw it to the dogs; but not before it had made its teeth meet in my arm just above the wrist. For some weeks I had to carry my arm in a sling, and I shall carry the marks of the bite to my grave."

The chaus, as will be seen from the above, wanders boldly down into the outskirts of large towns, cantonments, and bungalows, on the lookout for chickens and pigeons. Its favourite plan is to lie up at dawn in some piece of thick cover near to where the poultry wander out to scratch, feed, and bask. It then pounces on the nearest unhappy hen and rushes off with it into cover. An acquaintance of the writer once had a number of fine Indian game fowl, of which he was not a little proud. He noticed that one was missing every morning for three days, and, not being able to discover the robber, shut them up in a hen-house. Next morning he heard a great commotion outside, and one of his bearers came running in to say that a leopard was in the hen-house. As this was only built of bamboo or some such light material, it did not seem probable that a leopard would stay there. Getting his rifle, he went out into the compound, and cautiously approached the hen-house, in which the fowls were still making loud protests and cries of alarm. The door was shut; but some creature—certainly not a leopard—might have squeezed in through the small entrance used by the hens. He opened the door, and saw at the back of the hen-house a chaus sitting, with all its fur on end, looking almost as large as a small leopard. On the floor was one dead fowl. The impudent jungle-cat rushed for the door, but had the coolness to seize the hen

It is, however, much stronger than the tame cats, with which it interbreeds freely. In the Colony it is often difficult to keep male tame cats, for the wild Kaffir cats come down and fight them in the breeding-season. The Egyptian cat is really the same animal, slightly modified by climate. A very distinct species is the JUNGLE-CAT, ranging from India, through Baluchistan, Syria, and East Africa, and called in Hindustani the CHAUS. The European striped wild cat extends to the Himalaya, where the range of the lion-coloured, yellow-eyed chaus begins. The chaus has a few black bars inside the legs, which vary in different regions. The Indian

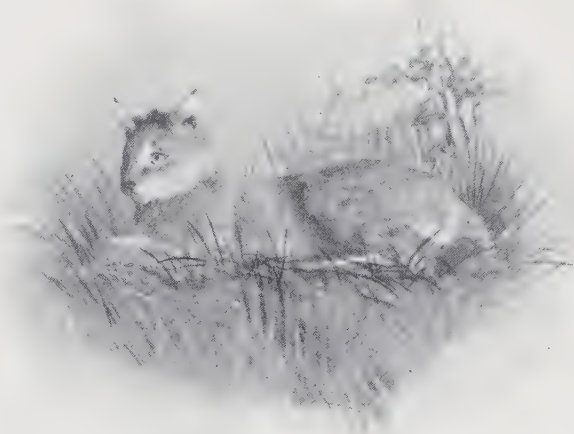


Photo by A. S. Rudland & Sons

AFRICAN CHAUS, OR JUNGLE-CAT

The chaus is the Indian and African equivalent of our wild cat. It is equally strong and savage

as it passed, and with this in its mouth rushed past the owner of the hens, his servants and retainers, and reached a piece of thick scrub near with its prize.

As the chaus is common both in India and Africa, a comparison of its habits in both continents is somewhat interesting. Jerdon, the Indian naturalist, writes: "It is the common wild cat from the Himalaya to Cape Comorin, and from the level of the sea to 7,000 or 8,000 feet elevation. It frequents alike the jungles and the open country, and is very partial to long reeds, and grass, sugarcane-fields, and corn-fields. It does much damage to all game, especially to hares and partridges. Quite recently I shot a pea-fowl at the edge of a sugarcane-field. One of these cats sprang out, seized the pea-fowl, and after a short struggle—for the bird was not quite dead—carried it off before my astonished eyes, and, in spite of my running up, made his escape with his booty. It must have been stalking these very birds, so closely did its spring follow my shot. It is said to breed twice a year, and to have three or four young at a birth. I have very often had the young brought to me, but always failed in rearing them; and they always showed a savage and untamable disposition. I have seen numbers of cats about villages in various parts of the country that must have been hybrids between this cat and the tame ones."

The late Sir Oliver St. John was more fortunate with his jungle-cat kittens. He obtained three in Persia. These he reared till they were three months old, by which time they became so tame that they would climb on to his knees at breakfast-time, and behave like ordinary kittens. One was killed by a greyhound, and another by a scorpion—a curious fate for a kitten to meet. The survivor then became morose and ill-tempered, but grew to be a large and strong animal. "Two English bull-terriers of mine, which would make short work of the largest domestic cat, could do nothing against my wild cat," says the same writer. "In their almost daily battles the dogs always got the worst of it."

In Africa the chaus haunts the thick cover bordering the rivers. There it catches not only water-fowl, but also fish. According to Messrs. Nicolls and Eglington, "its spoor may constantly be seen imprinted on the mud surrounding such pools in the periodical watercourses as are constantly being dried up, and in which fish may probably be imprisoned without chance of escape." The chaus has for neighbour in Africa the beautiful SERVAL, a larger wild cat. This species is reddish in colour, spotted on the body, and striped on the legs. The ears are long, but not tufted, like those of the lynx. The serval is more common in North and Central Africa than in the South. But it is also found south of the Tropic of Capricorn. Messrs. Nicolls and Eglington say of it: "Northward through South Central Africa it is fairly common. It frequents the thick bush in the vicinity of rivers. The *karosses*, or mantles, made from its skins

are only worn by the chiefs and very high dignitaries amongst the native tribes, and are in consequence eagerly sought after, on which account the species runs a risk of rapid extermination. Its usual prey consists of the young of the smaller antelopes, francolins, and wild guinea-fowls, to the latter of which it is a most destructive enemy in the breeding-season. When obtained young, the serval can be tamed with little trouble; but it is difficult to rear, and always shows a singular and almost unaccountable aversion to black men. Its otherwise even temper is always aroused at the sight of a native.



Photo by L. Medland, F.Z.S.]

[North Finchley

SERVAL

This is a spotted cat, with long ears, but no tufts on them, as in the true lynxes



Photo by Ottomar Anschütz.

[Berlin

MALE SERVAL

The serval is a link between the leopards and tiger-cats, quite large enough to kill the young of the smaller antelopes



Photo by Ottomar Anschütz

[Berlin]

SERVAL CLIMBING

Note the active, cat-like method of climbing

had three small Skye terriers with me, which immediately gave chase, and pursued her till she took refuge in a corner of the rocks, where, perched in a kind of recess out of reach of her enemies, she stood with her hair bristled out, spitting and growling like a common cat. Having no weapon with me, I laid down my rod, cut a good-sized stick, and proceeded to dislodge her. As soon as I was within six or seven feet of the place, she sprang straight at my face over the dogs' heads. Had I not struck her in mid-air as she leaped at me, I should probably have received a severe wound. As it was, she fell with her back half broken among the dogs, who with my assistance dispatched her. I never saw an animal fight so desperately, or one which was so difficult to kill. If a tame cat has nine lives, a wild cat must have a dozen. Sometimes one of these animals will take up its residence at no great distance from a house, and, entering the hen-roosts and outbuildings, will carry off fowls in the most audacious manner, or even lambs. Like other vermin, the wild cat haunts the shores of lakes and rivers,

When in anger, it is by no means a despicable antagonist, and very few dogs would like to engage in a combat with one single-handed."

THE COMMON WILD CAT

The WILD CAT was once fairly common all over England. A curious story, obviously exaggerated, shows that traditions of its ferocity were common at a very early date. The tale is told of the church of Barnborough, in Yorkshire, between Doncaster and Barnsley. It is said that a man and a wild cat met in a wood near and began to fight; that the cat drove the man out of the wood as far as the church, where he took refuge in the porch; and that both the man and cat were so injured that they died. According to Dr. Pearce, the event was formerly commemorated by a rude painting in the church.

Mr. Charles St. John had an experience with a Scotch wild cat very like that which General Douglas Hamilton tells of the jungle-cat. He heard many stories of their attacking and wounding men when trapped or when their escape was cut off, and before long found out that these were true. "I was fishing in a river in Sutherland," he wrote, "and in passing from one pool to another had to climb over some rocky ground. In doing so, I sank almost up to my knees in some rotten heather and moss, almost upon a wild cat which was concealed under it. I was quite as much startled as the cat itself could be, when I saw the wild-looking beast rush so unexpectedly from between my feet, with every hair on her body on end, making her look twice as large as she really was. I

and it is therefore easy to know where to set a trap for them. Having caught and killed one of the colony, the rest of them are sure to be taken if the body of their slain relative is left in the same place not far from their usual hunting-ground and surrounded with traps, as every wild cat passing that way will to a certainty come to it."

The wild cat ranges from the far north of Scotland, across Europe and Northern Asia, to the northern slopes of the Himalaya. It has always been known as one of the fiercest and wildest of the cats, large or small. The continual ill-temper of these creatures is remarkable. In the experience of the keepers of menageries there is no other so intractably savage. One presented to the Zoological Gardens by Lord Lilford some eight years ago still snarls and spits at any one who comes near it, even the keeper.

The food of the wild cat is grouse, mountain-hares, rabbits, small birds, and probably fish caught in the shallow waters when chance offers. It is wholly nocturnal; consequently no one ever sees it hunting for prey. Though it has long been confined to the north and northwest of Scotland, it is by no means on the verge of extinction. The deer-forests are saving it to some extent, as they did the golden eagle. Grouse and hares are rather in the way when deer are being stalked; consequently the wild cat and the eagle are not trapped or shot. The limits of its present fastnesses were recently fixed by careful Scotch naturalists at the line of the Caledonian Canal. Mr. Harvie Brown, in 1880, said that it only survived in Scotland north of a line running from Oban to the junction of the three counties of Perth, Forfar, and Aberdeen, and thence through Banffshire to Inverness. But the conclusion of a writer in the *Edinburgh Review* of July, 1898, in a very interesting article on the survival of British mammals, has been happily contradicted. He believed that it only survived in the deer-forests of Inverness and Sutherlandshire. The wild cats shown in the illustrations of these pages were caught a year later as far south as Argyllshire. The father and two kittens were all secured, practically unhurt, and purchased by Mr. Percy Leigh Pemberton for his collection of British mammals at Ashford, in Kent. This gentleman has had great success in preserving his wild cats. They, as well as others—martens, polecats, and other small carnivora—are fed on fresh wild rabbits killed in a warren near; consequently they are in splendid condition. The old "tom" wild cat, snarling with characteristic ill-humour, was well supported by the wild and savage little kittens, which exhibited all the family temper. Shortly before the capture of these wild cats another



By permission of Percy Leigh Pemberton, Esq.

EUROPEAN WILD CAT

The British representative of this species is rapidly becoming extinct. The specimen whose portrait is given here was caught in Argyllshire



By permission of Percy Leigh Pemberton, Esq.

SCOTCH WILD CATS

These wild cats, the property of Mr. P. Leigh Pemberton, though regularly fed and well treated, show their natural bad-temper in their faces

family were trapped in Aberdeenshire and brought to the Zoological Gardens. Four kittens, beautiful little savages, with bright green eyes, and uninjured, were safely taken to Regent's Park. But the quarters given them were very small and cold, and they all died. Two other full-grown wild cats brought there a few years earlier were so dreadfully injured by the abominable steel traps in which they were caught that they both died of blood-poisoning.

The real wild cats differ in their markings on the body, some being more clearly striped, while others are only brindled. But they are all alike in the squareness and thickness of head and body, and in the short tail, ringed with black, and growing larger at the tip, which ends off like a shaving-brush.

It may well be asked, Which of the many species of wild cats mentioned above is the ancestor of our domestic cats? Probably different species in different countries. The African Kaffir cat, the Indian leopard-cat, the rusty-spotted cat of India, and the European wild cat all breed with tame cats. It is therefore probable that the spotted, striped, and brindled varieties of tame cats are descended from wild species which had those markings. The so-called red tame cats are doubtless descended from the tiger-coloured wild cats. But it is a curious fact that, though the spotted gray-tabby wild varieties are the least common, that colour is most frequent in the tame species.

THE LYNXES

IN the LYNXES we seem to have a less specially cat-like form. They are short-tailed, high in the leg, and broad-faced. Less active than the leopards and tiger-cats, and able to live either in very hot or very cold countries, they are found from the Persian deserts to the far north of Siberia and Canada.

The CARACAL is a southern, hot-country lynx. It has a longer tail than the others, but the same tufted ears. It seems a link between the lynxes and the jungle-cats. It is found in India, Palestine, Persia, and Mesopotamia. In India it was trained, like the cheeta, to catch birds,

gazelles, and hares. The COMMON LYNX is probably the same animal, whether found in Norway, Russia, the Carpathians, Turkestan, China, or Tibet. The CANADIAN LYNX is also very probably the same, with local differences of colour. The NORTHERN LYNX is the largest feline animal left in Europe, and kills sheep and goats equally with hares and squirrels. The beautiful fur, of pale cinnamon and light gray, is much admired. In some southern districts of America we have the RED LYNX, or so-called "wild cat," which is distinct from the lynx of Canada. The MEDITERRANEAN or SPANISH LYNX seems likewise entitled to rank as a distinct species.

Of the lynxes the CARACALS are perhaps the most interesting, from their capacity for domestication. They are found in Africa in the open desert country, whereas the SERVALL is found in the thick bush. In Africa it is believed to be the most savage and untamable of the Cats. That is probably because the Negro and the Kaffir never possessed the art of training animals, from the elephant downwards. In India the caracal's natural prey are the fawns of deer and antelope, pea-fowl, hares, and floricans. The caracal is the quickest with its feet of any of the Cats. One of its best-known feats is to spring up and catch birds passing over on the wing at a height of six or eight feet from the ground. A writer, in the Naturalist's Library, notes that, besides being tamed to catch deer, pea-fowl, and cranes, the caracal was used in "pigeon matches." Two caracals were backed one against the other to kill pigeons. The birds were fed on the ground, and the caracals suddenly let loose among them, to strike down as many as each could before the birds escaped. Each would sometimes strike down with its forepaws ten or a dozen pigeons. "Caracal" means in Turkish "Black Ear," in allusion to the colour of the animal's organ of hearing.

The COMMON LYNX is a thick-set animal, high in the leg, with a square head and very strong paws and forearms. It is found across the whole northern region of Europe and Asia. Although never known in Britain in historic times, it is still occasionally seen in parts of the Alps and in the Carpathians; it is also common in the Caucasus. It is mainly a forest animal, and very largely nocturnal; therefore it is seldom seen, and not often hunted. If any enemy approaches, the lynx lies perfectly still on some branch or rock, and generally succeeds in avoiding notice. The lynx is extremely active; it can leap great distances, and makes its attack usually



Photo by Ottomar Anschütz

[Berlin

LYNX

This animal is a uniformly coloured species common to India and Africa

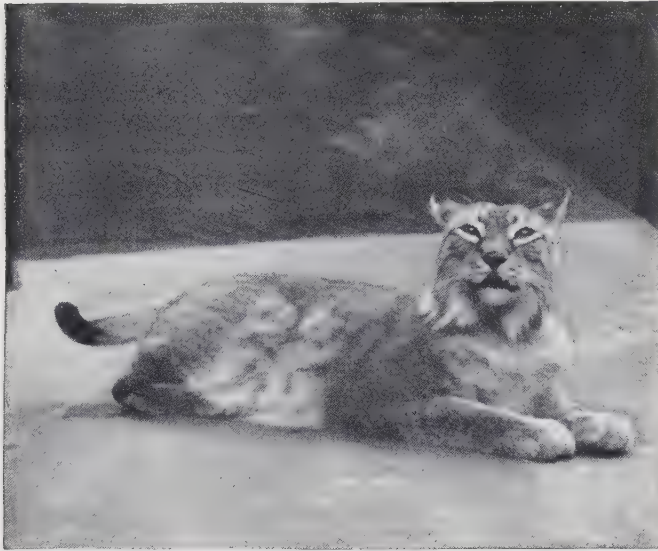


Photo by A. S. Rudland & Sons

EUROPEAN LYNX

The largest of the cat tribe left in Europe

grouse of the North American forests. The flesh of the lynx is said to be good and tender.

Brehm says of the Siberian lynx: "It is a forest animal in the strictest sense of the word. But in Siberia it occurs only singly, and is rarely captured. Its true home is in the thickest parts in the interior of the woods, and these it probably never leaves except when scarcity of food or the calls of love tempt it to wander to the outskirts. Both immigrants and natives hold the hunting of the lynx in high esteem. This proud cat's activity, caution and agility, and powers of defense arouse the enthusiasm of every sportsman, and both skin and flesh are valued, the latter not only by the Mongolian tribes, but also by the Russian hunters. The lynx is seldom captured in fall-traps; he often renders them useless by walking along the beam and stepping on the lever, and he usually leaps over the spring-traps in his path. So only the rifle and dogs are left."

The RED LYNX is a small American variety, the coat of which turns tawny in summer, when it much resembles a large cat. It is called in some parts of the United States the Mountain-cat. This lynx is 30 inches long in the body, with a tail 6 inches long. It is found on the eastern or Atlantic side of the continent, and by no means shuns the neighbourhood of settlements.

in that way. When traveling, it trots or gallops in a very dog-like fashion. Where sheep graze at large on mountains, as in the Balkans and in Greece, the lynx is a great enemy of the flocks. In Norway, where the animal is now very rare, there is a tradition that it is more mischievous than the wolf, and a high price is set on its head.

In Siberia and North Russia most of the lynx-skins taken are sold to the Chinese. The lynx-skins brought here are mainly those of the Canadian species. The fur is dyed, and used for the busbies of the officers in the hussar regiments. These skins vary much in colour, and in length and quality of fur. The price varies correspondingly. The Canadian lynx lives mainly on the wood-hares and on the wood-



By permission of Mr. S. B. Gundy]

CANADIAN LYNX

Great numbers of these are trapped every year for the sake of their fur

[Toronto]



Photo by Ottomar Anschütz

[Berlin

CHEETAS

Cheetas can be distinguished at a glance from the ordinary leopards by the solid black spots upon the back instead of the "rosettes."

THE CHEETA
THE NON-RETRACTILE-CLAWED CAT



Photo by York & Son]

[Notting Hill

A CHEETA HOODED

The cheeta is not unhooded until fairly near his quarry, when he is given a sight of the game, and a splendid race ensues

one accomplishment. The young cheeta is not worth catching, for it has not yet learnt its trade, nor can it be taught in captivity. . . . There are certain trees where these great dog-cats (for they have some oddly canine characteristics) come to play and whet their claws. The hunters find such a tree, and arrange nooses of deer-sinew round it, and wait the event. The animal comes and is caught by the leg, and it is at this point that the trouble begins. It is no small achievement for two or three naked, ill-fed men to secure so fierce a capture and carry it home tied on a cart. Then his training begins. He is tied in all directions, principally from a thick rope round his loins, while a hood fitted over his head effectually blinds him. He is fastened on a strong cot-bedstead, and the keepers and their wives and families reduce him to submission by starving him and keeping him awake. His head is made to face the village street, and for an hour at a time, several times a day, his keepers make pretended rushes at him, and wave clothes, staves, and other articles in his face. He is talked to continually, and the women's tongues are believed to be the most effective of things to keep him awake. No created being could withstand the effects of hunger, want of sleep, and feminine scolding; and the poor cheeta becomes piteously, abjectly tame. He is taken out for a walk occasionally—if a slow crawl between four attendants, all holding hard, can be called a walk—and his promenades are always through the crowded streets and bazaars, where the keepers' friends are to be found; but the people are rather pleased than otherwise to see the raja's cheetas amongst them." Later, when the creature is tamed, "the cheeta's bedstead is like that of the keeper, and leopard and man are often curled up under the same blanket! When his bedfellow is restless, the keeper lazily stretches out an arm from his end of the coat and dangles a tassel over the animal's head, which seems to soothe him. In the early morning I have seen a cheeta sitting up on his couch, a red blanket half covering him, and his tasseled red hood awry, looking exactly like an elderly gentleman in a nightcap, as he yawns with the irresolute air of one who is in doubt whether to rise or to turn in for another nap."

THE CHEETA, or Hunting-leopard, is the only example of this particular group, though there was an extinct form, whose remains are found in the Siwalik Hills, in the north of India. It is a very widely dispersed animal, found in Persia, Turkestan, and the countries east of the Caspian, and in India so far as the lower part of the centre of the peninsula. It is also common in Africa, where until recent years it was found in Cape Colony and Natal. Now it is banished to the Kalahari Desert, the Northern Transvaal, and Bechuanaland.

The cheeta is more dog-like than any other cat. It stands high on the leg, and has a short, rounded head. Its fur is short and rather woolly, its feet rounded, and its claws, instead of slipping back into sheaths like a lion's, are only partly retractile.

Mr. Lockwood Kipling gives the following account of the cheeta and its keepers: "The only point where real skill comes into play in dealing with the hunting-leopard is in catching the adult animal when it has already learnt the swift, bounding onset, its

This charming and accurate description shows the cheeta at home. In the field he is quite another creature. He is driven as near as possible to the game, and then unhooded and given a sight of them. Sir Samuel Baker thus describes a hunt in which a cheeta was used: "The chase began after the right-hand buck, which had a start of about 110 yards. It was a magnificent sight to see the extraordinary speed of pursuer and pursued. The buck flew over the level surface, followed by the cheeta, which was laying out at full stretch, with its long, thick tail brandishing in the air. They had run 200 yards, when the keeper gave the word, and away we went as fast as our horses could carry us. The horses could go over this clear ground, where no danger of a fall seemed possible. I never saw anything to equal the speed of the buck and the cheeta; we were literally nowhere, although we were going as hard as horse-flesh could carry us; but we had a glorious view. The cheeta was gaining in the course, while the buck was exerting every muscle for life or death in its last race. Presently, after a course of about a quarter of a mile, the buck doubled like a hare, and the cheeta lost ground as it shot ahead, instead of turning quickly, being only about thirty yards in rear of the buck. Recovering itself, it turned on extra steam, and the race appeared to recommence at increased speed. The cheeta was determined to win, and at this moment the buck made another double in the hope of shaking off its terrible pursuer; but this time the cheeta ran cunning, and was aware of the former game. It turned as sharply as the buck. Gathering itself together for a final effort, it shot forward like an arrow, picked up the distance which remained between them, and in a cloud of dust we could for one moment distinguish two forms. The next instant the buck was on its back, and the cheeta's fangs were fixed like an iron vice in its throat. The course run was about 600 yards, and it was worth a special voyage to India to see that hunt."



Photo by Ottomar Anschütz

[Berlin]

A CHEETA ON THE LOOK-OUT

Cheetas are common to Africa and India. By the native princes of the latter country they are much used for taking antelope and other game

THE DOMESTIC CAT

By LOUIS WAIN



Photo by T. Fall]

[Baker Street

WHITE SHORT-HAIRED

Most white cats are not albinos—that is to say, they have ordinarily coloured and not red eyes

showing remarkable readiness in pitching upon their quarry and pinning it down until secured. These farm cats are quite a race by themselves. Of decided sporting proclivities, they roam the countryside with considerable fierceness, and yet revert to the domesticity of the farmhouse fire-side as though innocent of roving instincts. They are spasmodic to a degree in their mode of life, and apparently work out one mood before entering upon another. It will be remembered that this spasmodic tendency—the true feline independence, by the bye—is and has been characteristic of the cat throughout its history, and any one who has tried to overcome it has met with failure.

Watch your own cat, and you will see that he will change his sleeping-quarters periodically ; and if he can find a newspaper conveniently placed, he will prefer it to lie upon, before anything perhaps, except a cane-bottomed chair, to which all cats are very partial. If you keep a number of cats, as I do, you will find that they are very imitative, and what one gets in the habit of doing they will all do in time : for instance, one of my cats took to sitting with his front paws inside my tall hat and his body outside, and this has become a catty fashion in the family, whether the object be a hat, cap, bonnet, small basket, box, or tin. If by chance one of the cats is attacked by a dog, a peculiar cry from the aggrieved animal will immediately awaken the others out of their lethargy or sleep, and bring them fiercely to the rescue. They are, too, particularly kind and nice to the old cat, and are tolerant only of strange baby kittens and very old cats in the garden as long as they do not interfere with the “catty” subject. The same quality obtains in Spain or Portugal, where a race of scavenging cats exists, which go about in droves or families, and are equal to climbing straight walls, big trees, chimneys, and mountainsides. Long, lanky, and thin, they are built more on the lines of a greyhound than the ordinary cat, and are more easily trained in tricks than home cats.

The TORTOISESHELL has long been looked upon as the national cat of Spain, and in fact that country is overrun with the breed, ranging from a dense

Of the domestication of the cat we know very little, but it is recorded that a tribe of cats was trained to retrieve—*i.e.*, to fetch and carry game. In our own time I have seen many cats fetch and carry corks and newspapers, and on one occasion pounce upon a small roach at the end of a line and place it at its owner's feet. Gamekeepers whom I have known agree that, for cunning, craftiness, and tenacity in attaining an object, the semi-wild cat of the woods shows far superior intelligence to the rest of the woodland denizens. It is quite a usual thing to hear of farm cats entering upon a snake-hunting expedition with the greatest glee, and



Photo by T. Fall]

[Baker Street

LONG-HAIRED WHITE

White cats with blue eyes are generally deaf, or at all events hard of hearing



Photo by Fratelli Alinari, Florence

MACKEREL-MARKED TABBY

Tabbies are probably the best known and the commonest cats



Photo by L. Medland, F.Z.S., North Finchley

CAT CARRYING KITTEN

A unique photograph, showing the way in which the cat carries its young



Photo by E. Lander, Ealing

BLUE LONG-HAIRED, OR PERSIAN

Persian or long-haired cats are of various colours; this is one of the least common



By permission of Lady Alexander

ORANGE TABBY

A champion winner of 90 first prizes



Photo by E. Lander, Ealing

SMOKE AND BLUE LONG-HAIRED

Two pretty and valuable Persian kittens



Photo by E. Lander, Ealing

LONG-HAIRED TABBY

A pretty pose



Photo by E. Lander, Ealing

SILVER PERSIAN

A handsome specimen



Photo by E. Lander, Ealing

SMOKE LONG-HAIRED, OR PERSIAN

A new breed

black and brown to lighter shades of orange brown and white. The pure tortoiseshell might be called a black and tan, with no white, streaked like a tortoiseshell comb if possible, and with wonderful amber eyes. It is characteristic of their intelligence that they will invariably find their way home, and will even bring that mysterious instinct to bear which guides them back long distances to the place of their birth; and, with regard to this cat, the stories of almost impossible journeys made are not one bit exaggerated. The tom-cats of this breed are very rare in England; I myself have only known of the existence of six in fifteen years, and of these but three are recorded in the catalogues of the cat shows.

The BLACK CAT has many of the characteristics of the tortoiseshell, but is essentially a town cat, and is wont to dream his life away in shady corners, in underground cellars, in theatres, and in all places where he can, in fact, retire to monastic quiet. The black cat of St. Clement Danes Church was one of the remarkable cats of London. It was his wont to climb on to the top of the organ-pipes and enjoy an occasional musical concert alone. A christening or a wedding was his pride; and many people can vouch for a lucky wedding who had the good-fortune to be patronised by the black cat of St. Clement Danes, which walked solemnly down the aisle of the church in front of the happy couples.

My old pet Peter was a black-and-white cat, and, like most of his kind, was one of the most remarkable cats for intelligence I have ever known. A recital of his accomplishments would, however, have very few believers—a fact I find existing in regard to all really intelligent cats. There are so many cats of an opposite character, and people will rarely take more than a momentary trouble to win the finer nature of an animal into existence. Suffice it to say, that Peter would lie and die, sit up with spectacles on his nose and with a post-card between his paws—a trick I have taught many people's cats to do. He would also mew silent meows when bid, and wait at the door for my home-coming. For a long time, too, it was customary to hear weird footfalls at night outside the bedroom doors, and visitors to the house were a little more superstitious as to their cause than we were ourselves. We set a watch upon the supposed ghost, but sudden opening of the doors discovered only the mystic form of Peter sitting purring on the stairs. He was, however, ultimately caught in the act of lifting the corner of the door-rug and letting it fall back in its place, and he had grown quite expert in his method of raising and dropping it at regular intervals until he heard that his signals had produced the required effect, and the door was opened to admit him.

WHITE CATS I might call musical cats, for it is quite characteristic of the albinos that noises rarely startle them out of their simpering, loving moods. The scraping of a violin, which will scare an ordinary cat out of its senses, or the thumping of a piano, which would terrorise even strong-nerved cats, would only incite a white cat to a happier mood. Certainly all white cats are somewhat deaf, or lack acute quality of senses; but this failing rather softens the feline nature than becomes dominant as a weakness.



SHORT-HAIRED BLUE

This champion cat belongs to Lady Alexander, by whose kind permission it is here reproduced



Photo by T. Fall

SILVER TABBY

A beautiful variety of a typical cat

[Baker Street]

The nearest to perfection perhaps, and yet at the same time extremely soft and finely made, is the BLUE CAT, rare in England as an English cat, but common in most other countries, and called in America the Maltese Cat—for fashion's sake probably, since it is too widely distributed there to be localised as of foreign origin. It is out in the mining districts and agricultural quarters, right away from the beaten tracks of humanity, where the most wonderful breeds of cats develop in America; and caravan showmen have told me that at one time it was quite a business for them to carry cats into these wildernesses, and sell them to rough, hardy miners, who dealt out death to each other without hesitation in a quarrel, but who softened to the appeal of an animal which reminded them of homelier times.

One man told me that upon one occasion he sold eight cats at an isolated mining township in Colorado, and some six days' journey farther on he was caught up by a man on horseback from the township, who had ridden hard to overtake the menagerie caravan, with the news that one of the cats had climbed a monster pine-tree, and that all the other cats had followed in his wake; food and drink had been placed in plenty at the foot of the tree, but that the cats had been starving, frightened out of their senses, for three days, and despite all attempts to reach them they had only climbed higher and higher out of reach into the uppermost and most dangerous branches of the pine. The showman hastened with his guide across country to the township, only to find that in the interval one bright specimen of a man belonging to the village had suggested felling the tree and so rescuing the cats from the pangs of absolute starvation, should they survive the ordeal. A dynamite cartridge had been used to blast the roots of the pine, and a rope attached to its trunk had done the rest and brought the monster tree to earth, only, however, at the expense of all the cats, for not one survived the tremendous fall and shaking. A sad and tearful procession followed the remains of the cats to their hastily dug grave, and thereafter a bull mastiff took the place of the cats in the township, an animal more in character with the lives of its inhabitants.



Photo by E. Lander]

[Ealing

SHORT-HAIRED TABBY

This is perhaps the most famous cat now living. It has won no less than 200 prizes



Photo by E. Lander]

[Ealing

LONG-HAIRED ORANGE

A good specimen of this variety is always large and finely furred

Analogous to this case of the traveling menageries, we have the great variety of blues, silvers, and whites which are characteristic of Russia. There is a vast tableland of many thousands of miles in extent, intersected by caravan routes to all the old countries of the ancients, and it is not astonishing to hear of attempts being made



Photo by C. Reid]

[Wishaw, N. B.

MANX

These tailless cats are well known; they were formerly called "Cornwall cats." Note the length of the hind legs, which is one of the characteristics of this variety of the domestic cat

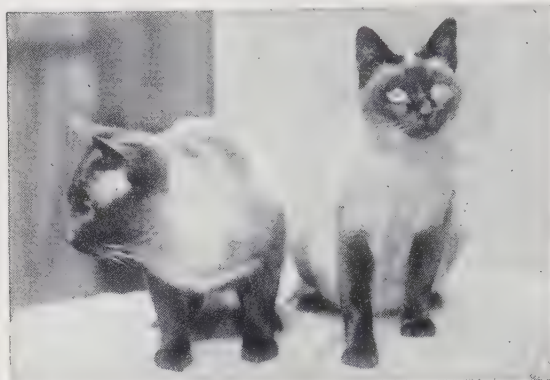


Photo by E. Landor]

[Ealing

SIAMESE

These strikingly coloured cats are now fairly numerous, but command high prices. They have white kittens, which subsequently become coloured

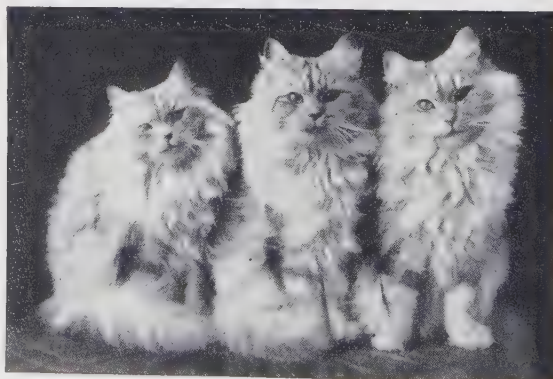
to steal the wonderful cats of Persia, China, and Northern India, as well as those of the many dependent and independent tribes which bound the Russian kingdom. But it is a remarkable fact that none but the blues can live in the attenuated atmosphere of the higher mountainous districts through which they are taken before arriving in Russian territory. It is no uncommon thing to find a wonderful complexity of blue cats shading to silver and white in most Russian villages, or blue cats of remarkable beauty, but with a dash of tabby-marking running through their coats. Their life, too, is lived at the two extremes. In the short Russian summer they roam the woodlands, pestered by a hundred poisonous insects; in the winter they are imprisoned within the four walls of a snow-covered cottage, and are bound down prisoners to domesticity till the thaw sets in again. Many of the beautiful furs which come to us from Russia are really the skins of these cats, the preparation of which for market has grown into a large and thriving industry. The country about Kronstadt, in the Southern Carpathian Mountains of Austria, is famous for its finely developed animals; and here, too, has grown up a colony of sable-coloured cats, said to be of Turkish origin, where the pariahs take the place of cats.

The TABBY is remarkable to us in that it is characteristic of our own country, and no other colour seems to have been popular until our own times. If you ask any one which breed of cat is the real domestic cat, you will be told the tabby, probably because it is so well known to all. The complexity of the tabby is really remarkable, and for shape and variety of colouring it has no equal in any other tribe of cat. It has comprised in its nature all the really great qualities of the feline, and all its worst attributes. You can truthfully say of one of its



BLUE LONG-HAIRED, OR PERSIAN

This cat belonged to Queen Victoria



SILVER PERSIANS

Three of Mrs. Champion's celebrated cats



Photo by E. Lander]

[Eating

LONG-HAIRED CHINCHILLA*Note the beautiful "fluffiness" of this cat's fur*

and distinct tribe out of its parentage. The MANX CAT is nearly allied to it, and a hundred years ago the tailless cat was called the Cornwall Cat, not the Manx.

Siam sends us a regal animal in the SIAMESE ROYAL CAT; it has a brown face, legs, and tail, a cream-coloured body, and mauve or blue eyes. The Siamese take great care of their cats, for it is believed that the souls of the departed are transmitted into the bodies of animals, and the cat is a favourite of their creed; consequently the cats are highly cultivated and intelligent, and can think out ways and means to attain an end.

I have tried for years to trace the origin of the LONG-HAIRED or PERSIAN CATS, but I cannot find that they were known to antiquity, and even the records of later times only mention the SHORT-HAIRED. European literature does not give us an insight into the subject; and unless Chinese history holds some hidden lights in its records, we are thrown back upon the myths of Persia to account for the wonderful modern contribution of the long-haired cat, which is gradually breeding out into as many varieties as the short-haired, with this difference—that greater care and trouble are taken over the long-haired, and they will, as a breed, probably soon surpass the short-haired for intelligence and culture.

One variety is quite new and distinctive—the SMOKE LONG-HAIRED, whose dark brown or black surface-coat, blown aside, shows an under coat of blue and silver, with a light brown frill round its neck. All the other long-haired cats can pair with the short-haired for colouring and marking, but I have not yet seen a BUNNY LONG-HAIRED.

specimens that it attaches itself to the individual, while of another in the same litter you will get an element of wildness. A third of the same parents will sober down to the house, but take only a passing notice of people. You can teach it anything if it is tractable, make it follow like a dog, come to whistle, but it will have its independence.

The SAND-COLOURED CAT, with a whole-coloured coat like the rabbit, which we know as the ABYSSINIAN or BUNNY CAT, is a strong African type. On the Gold Coast it comes down from the inland country with its ears all bitten and torn away in its fights with rivals. It has been acclimatised in England, and Devonshire and Cornwall have both established a new



Photo by H. Trevor Jessop

THE "BUN" OR "TICKED" SHORT-HAIRED CAT

This is one of the rarest of cats. It belongs to Miss K. Maud Bennett who has kindly had it photographed for this work

CHAPTER III

THE FOSSA, CIVETS, AND ICHNEUMONS

THE FOSSA



Photo by A. S. Rudland & Sons

FOSSA

The only feline animal of Madagascar

to captivity; indeed, the first time that one was exhibited in the Zoological Gardens was only ten years ago. Formerly stories were told of its ferocity, which was compared to that of the tiger. These tales were naturally the subject of ridicule. The fossa usually attains a length of about 5 feet from snout to tail, and is the largest of the carnivora of Madagascar. A fine young specimen lately brought to London, and in the Zoological Gardens at the time of writing, is now probably full grown. It is about the same length and height as a large ocelot, but with a far longer tail, and is more slenderly built. The extreme activity of the fossa no doubt renders it a very formidable foe to other and weaker creatures. It has been described by a recent writer as being entirely nocturnal, and preying mainly on the lemurs and birds which haunt the forests of Madagascar. The animal kept at the Zoological Gardens has become fairly tame. It is fed mainly on chickens' heads and other refuse from poulterers' shops. Apparently it has no voice of any kind. It neither growls, roars, nor mews, though, when irritated or frightened, it gives a kind of hiss like a cat.

IN the Fossa Madagascar possesses an altogether peculiar animal. It is a very slender, active creature, with all its proportions much elongated. It is of a bright bay uniform colour, with thick fur, and has sharp retractile claws. It has been described as the natural connecting link between the Civets and the Cats, anatomically speaking. Thus it has retractile claws, but does not walk on its toes, like cats, but on the soles of its feet (the hind pair of which is quite naked), like a civet. Very few have been brought



Photo by L. Medland, F.Z.S.]

[North Finchley

LARGE INDIAN CIVET

Civets are nocturnal in their habits. That shown here has just awakened in broad daylight

THE CIVETS AND GENETS

THE CIVETS are the first marked deviation from the Cat Family. Their bodies are elongated, their legs short, their claws only partially retractile. Some of them have glands holding a strong scent, much esteemed in old days in Europe, when "The Civet Cat" was a common inn-sign even in England. The civets are generally beautifully marked with black stripes and bands on gray. But none of them grow to any large size, and the family has never had the importance of those which contain the large carnivora, like the true cats or bears. Many of the tribe and its connections are domesticated. Some scholars have maintained that the cat of the ancient Greeks was one of them—the common genet. The fact is that both this and the domestic cat were kept by the ancients; and the genet is still used as a cat by the peasants of Greece and Southern Italy.

The AFRICAN CIVET and INDIAN CIVET are large species. The former is common almost throughout Africa. Neither of them seems to climb trees, but they find abundance of food by catching small ground-dwelling animals and birds. They are good swimmers. The Indian civet has a handsome skin, of a beautiful gray ground-colour, with black collar and markings. It is from these civets that the civet-scent is obtained. They are kept in cages for this purpose, and the secretion is scooped from the glands with a wooden spoon. They produce three or four kittens in May or June. Several other species very little differing from these are known as the MALABAR, JAVAN, and BURMESE CIVETS.

The RASSE is smaller, has no erectile crest, and its geographical distribution extends from Africa to the Far East. It is commonly kept as a domestic pet. Like all the civets, it will eat fruit and vegetables.

The GENETS, though resembling the civets, have no scent-pouch. They are African creatures, but are found in Italy, Spain, and Greece, and in Palestine, and even in the south of France. Beautifully spotted or striped, they are even longer and lower than the civet-cats, and steal through the grass like weasels.

The COMMON GENET is black and gray, the latter being the ground-colour. The tail is very long, the length being about 15 inches, while that of the body and head is only 19 inches. Small rodents, snakes, eggs and birds are its principal food. It is kept in Southern Europe for



Photo by A. S. Rudland & Sons

AFRICAN CIVET

This is one of the largest of the Civet Tribe. The perfume known as "civet" is obtained from it



Photo by Scholastic Photo. Co.]

[Parson's Green

AFRICAN CIVET

This photograph shows the finely marked fur of the species and the front view of the head

fur, gray, marbled and spotted with black, and no disagreeable odour, except a scent of musk. It was a most active little creature, full of curiosity, and always anxious to explore not only every room, but every cupboard and drawer in the house. Perhaps this was due to its keenness in hunting mice, a sport of which it never tired. It did not play with the mice when caught as a cat does, but ate them at once.

The LINSANGS, an allied group, are met with in the East, from India to Borneo and Java. They are more slender than the genets, and more arboreal. Of the NEPALESE LINSANG Hodgson writes: "This animal is equally at home on trees and on the ground. It breeds and dwells in the hollows of decaying trees. It is not gregarious, and preys mainly on living animals." A tame female owned by him is stated to have been wonderfully docile and tractable, very sensitive to cold, and very fond of being petted. There is an allied West African species.

The PALM-CIVETS and HEMIGALES still further increase this numerous tribe. Slight differences of skull, of the markings of the tail, which may only have rings on the base, and of the foot and tail, are the naturalist's guide to their separation from the other civets; HARDWICKE'S HEMIGALE has more zebra-like markings. Borneo, Africa, India, and the Himalaya all produce these active little carnivora; but the typical palm-civets are Oriental. They are sometimes known as Toddy-cats, because they drink the toddy from the jars fastened to catch the juice. The groves of cocoanut-palm are their favourite haunts; but they will make a home in holes in the thatched roofs of houses, and even in the midst of cities. There are many species in the group.

The BINTURONG is another omnivorous, tree-haunting animal allied to the civets; but it has a prehensile tail, which few other mammals of the Old World possess. It is a blunt-nosed, heavy animal, sometimes called the Bear-cat. Very little is known of its habits. It is found from the Eastern Himalaya to Java.

The last of the Civet Family is BENNETT'S CIVET, the only instance of a cat-like animal with partly webbed feet. Found in the Malay Peninsula and in

killing rats. Several other very similar forms are found in Africa. The presence of such a very Oriental-looking animal in Europe is something of a surprise, though many persons forget that our South European animals are very like those of Africa and the East. The porcupine, which is common in Italy and Spain, and the lynx and Barbary ape are instances. A tame genet kept by an acquaintance of the writer in Italy was absolutely domesticated like a tame mongoose. It had very pretty



Photo by L. Medland, F.Z.S.]

[North Finchley

SUMATRAN CIVET

*A small and very beautiful member of the Civet Family.
It feeds largely on fish*

Sumatra and Borneo, it is very rare, but is known to feed on fish and crustacea, and to be semi-aquatic. The author of the chapter on the civets in the Naturalist's Library says, "It may be likened to a climbing otter."

THE MONGOOSE AND ICHNEUMON FAMILY

THESE are a numerous and useful race of small mammals, feeding mainly on the creatures most annoying to man within tropical countries. Snakes, the eggs of the crocodile, large lizard, rats, mice, and other creatures known generally as "vermin," are their favourite food. It must be added that, though they are most useful in destroying these, they also kill all kinds of birds, and that their introduction into some of the West India Islands, for the purpose of killing rats, has been fatal to the indigenous bird life.

THE INDIAN MONGOOSE

This universal favourite is one of the largest, the head and body being from 15 to 18 inches



Photo by A. S. Rudland & Sons

GENET

The genets are smaller than some civets, but allied to them. One was anciently domesticated like a cat

long, and the tail 14 inches. The fur is loose and long, and capable of being erected. As in all the tribe, the tint is a "pepper and salt," the "pepper" colour being sometimes blackish and sometimes red, but a speckled appearance characterises the whole group. This is the animal supposed to be immune from snake-bite. It is possibly so to some extent, for it kills and eats the poisonous snakes, and it is now known that the *eating* of snake-poison tends to give the same protection as inoculation does against certain diseases. But it is certain that in most cases the mongoose, by its activity, and by setting up the hair on its body, which makes the snake "strike short," saves itself from being bitten.

Many descriptions of the encounters between these brave little animals and the cobra have been written. Here is one of the less known: "One of our officers had a tame mongoose, a charming little pet. Whenever we could procure a cobra—and we had many opportunities—we used to turn it out in an empty storeroom, which had a window at some height from the ground, so that it was perfectly safe to stand there and look on. The cobra, when dropped from the bag or basket, would wriggle into one of the corners of the room and there coil himself up. The mongoose showed the greatest excitement on being brought to the window, and the moment



Photo by L. Medland, F.Z.S.]

[North Finchley

TWO-SPOTTED PALM-CIVET

This is a West African species, which, with an allied form from East Africa, represents the palm-civets in the Dark Continent

he was let loose would eagerly jump down into the room, when his behaviour became very curious and interesting. He would instantly see where the snake was, and rounding his back, and making every hair on his body stand out at right angles, which made his body appear twice as large as it really was, he would approach the cobra on tiptoe, making a peculiar humming noise. The snake, in the meantime, would show signs of great anxiety, and I fancy of fear, erecting his head and hood ready to strike when his enemy came near enough. The mongoose kept running backwards and forwards in front of the snake, gradually getting to within what appeared to us to be striking distance. The snake would strike at him repeatedly, and *appeared* to hit him, but the mongoose continued his comic dance, apparently unconcerned. Suddenly, and with a movement so rapid that the eye could not follow it, he would pin the cobra by the back of the head. One could hear the sharp teeth crunch into the skull, and, when all was over, see the mongoose eating the snake's head and part of his body with great gusto. Our little favourite killed a great many cobras, and, so far as I can see, never was bitten.

The EGYPTIAN MONGOOSE, or ICHNEUMON, has an equally great reputation for eating the eggs of the crocodile; and the KAFFIR MONGOOSE, a rather larger South African species, is kept as a domestic animal to kill rats, mice, and snakes, of which, like the Indian kind, it is a deadly foe. There are more than twenty other species, most of much the same appearance and habits.

The smooth-nosed mongoose tribe are closely allied creatures in South Africa, mainly burrowing animals, feeding both on flesh and fruit. The CUSIMANSES of Abyssinia and West Africa are also allied to them. Their habits are identical with the above.

THE MEERKATS, OR SURICATES

Most people who have read Frank Buckland's *Life* will remember the suricate which was his chief pet in Albany Street. The SURICATES, or MEERKATS, burrow all over the South African veldt, especially in the sandy parts, where they sit up outside their holes like prairie-dogs, and are seen by day. They are sociable animals, and make most amusing pets. A full-grown one is not much larger than a hedgehog, but more slender. It barks like a prairie-dog, and has many other noises of pleasure or anger. A lady, the owner of one, writes in *Country Life*: "It gets on well with the dogs and cats, especially the latter, as they are more friendly to her, and allow her to sleep by their side and on the top of them. One old cat brings small birds



Photo by L. Medland, F.Z.S.]

[North Finchley

MASKED PALM-CIVET

A whole-coloured species of the group



Photo by Robert D. Carson]

[Philadelphia

BINTURONG

The binturong is placed with the civets. It has a prehensile tail like the kinkajou (see page 127)

their razor edge by being drawn up into sheaths when the animal walks, but can be instantly thrust out at pleasure, rigid and sharp as sword-blades. The gradual process by which this equipment deteriorates in the Civets and disappears in the Mongoose should be noted. There are many other carnivora, but none so formidable as those possessing the retractile claws. Thus the Bears, though often larger in bulk than the Lion, are far inferior in the power of inflicting violent injury. At the same time such delicate mechanism is clearly not necessary for the well-being of a species. The members of the Weasel Tribe are quite as well able to take care of themselves as the small cats, though they have non-retractile and not very formidable claws.

Such a very abnormal animal as the BINTURONG—of which we are able to give an excellent photograph—is doubtless rightly assigned to the place in which modern science has placed it. But it will be found that there are several very anomalous forms quite as detached from any general type as is the binturong. Nature does not make species on any strictly graduated scale. Many of these nondescript animals are so unlike any other group or family that they seem almost freaks of nature. The binturong is certainly one of these.

The next group with which we deal is that of the Hyænas. In these the equipment for catching living prey is very weak. Speed and pursuit are not their *métier*, but the eating of dead and decaying animal matter, and the consumption of bones. Hence the jaws and teeth are highly developed, while the rest of the body is degenerate.

to her (her favourite is a sparrow), and makes her usual cry, and Janet runs to her and carries off the bird, which she eats, feathers and all, in a very few minutes, if she is hungry." When near a farm, the meerkats will devour eggs and young chickens. They are also said to eat the eggs of the large leopard-tortoise. The commonest is the SLENDER-TAILED MEERKAT. It is found all over South Africa, and is very common in the Karroo. It eats insects and grubs as well as small animals, and is commonly kept as a pet throughout the Colony.

WE have now traced the long line of the Carnivora from the lordly Lion, the slayer of man and his flocks and herds, and the Tiger, equally formidable and no less specially developed for a life of rapine on a great scale, to creatures as small and insignificant as the Meerkat, which is at least as much an insect-feeder as a devourer of flesh, and the Ichneumons and Civets. The highest form of specialisation in the group is the delicate mechanism by which the chief weapons of offense, the claws, are enabled to keep



Photo by L. Medland, F.Z.S.]

[North Finchley

MONGOOSE

The Indian mongoose is the great enemy of snakes. Another species eats the eggs of the crocodile



Photo by A. S. Rudland & Sons

MEERKAT

A small, mainly insectivorous animal, found in South Africa; also called the Suricate

The question of the comparative intelligence of the Apes and Monkeys, and the carnivorous animals subsequently described in these pages, is an interesting one. It would seem at first as if the Cat Tribe and their relations, which have to obtain their prey by constant hunting, and often to make use of considerable reflection and thought to bring their enterprises against other animals to a successful issue, would be more likely to develop intelligence and to improve in brain-power than the great Apes, which find an easy living in the tropical forests, and only seek fruits and vegetables for their food. Yet it is quite certain that this is not the case. The Cat Tribe, with the exception of the domesticated cats, does not show high intelligence. Even the latter are seldom trained to obey man, though they learn to accommodate themselves to his ways of life. There is no evidence that cats have any sense of number, or that any of them in a wild state make any effort to provide shelter for themselves or construct a refuge from their enemies, though the Leopard will make use of a cave as a lair. In matters requiring intelligence and cooperation, such rodents as the Beaver, or even the Squirrel, are far beyond the feline carnivora in sagacity and acquired or inherited ingenuity. Except the Stoat, which sometimes hunts in packs, no species of the carnivora yet dealt with in this work combines to hunt its prey, or for defense against enemies. Each for itself is the rule, and even among the less-specialised flesh-eating animals of the other groups it is only the Dog Tribe which seems to understand the principles of association for a common object.

CHAPTER IV

THE HYÆNAS AND AARD-WOLF

IF every animal has its place in nature, we must suppose that the hyæna's business is to clear up the bones and such parts of the animal dead as the vultures and other natural "undertakers" cannot devour. Hyænas have very strong jaws, capable of crushing almost any bone. In prehistoric times they were common in England, and lived in the caves of Derbyshire and Devon. In these caves many bones were found quite smashed up, as if by some very large wild animal. It was supposed that this was done by bears—Dean Buckland said "by hyænas." He procured a hyæna, kept it at his house, and fed it on bones. The smashed fragments he laid on the table at a scientific lecture beside the fragments from the caverns. The resemblance was identical, and the Dean triumphed.



Photo by A. S. Rudland & Sons

SPOTTED HYÆNA

The largest of the carrion-feeding animals. A South African species

beginning low and ending high. It also utters a horrible maniacal laugh when excited, which gives it the name of Laughing-hyæna. "Its appetite," says Mr. W. L. Sclater in his "South African Mammals," "is boundless. It is entirely carnivorous, but seems to prefer putrid and decaying matter, and never kills an animal unless driven to do so by hunger. Sheep and donkeys are generally attacked at the belly, and the bowels torn out by its sharp teeth. Horses are also frequent objects of attack; but in this case shackling is useful, as the horse, unable to escape, faces the hyæna, which instantly bolts. It is an excellent scavenger, and it has been known to kill and carry off young children, though the least attempt at pursuit will cause it to drop them. Many stories are told, too, of its attacking sleeping natives; in this case it invariably goes for the man's face. Drummond states that he has seen many men who had been thus mutilated, wanting noses, or with the whole mouth and lips torn away. This is confirmed by other authors." Drummond gives an instance of seven cows being mortally injured in a single night by two hyænas, which attacked them and bit off the udders. Poisoned meat is the only means to get rid of this abominable animal.

Sir Samuel Baker says: "I can safely assert that the bone-cracking power of this animal is extraordinary. I cannot say that it exceeds the lion or tiger in the strength

The hyænas are carnivorous animals, with the front limbs longer than the hind. The tail is short, the colour spotted or brindled, the teeth and jaws of great strength.

The BROWN HYÆNA, or STRAND-WOLF, is an African species, with very long, coarse hair, reaching a length of 10 inches on the back. It is not found north of the Zambesi; and it is nocturnal, and fond of wandering along the shore, where it picks up crabs and dead fish. Young cattle, sheep, and lambs are also killed by it, and offal of all kinds devoured.

The SPOTTED HYÆNA is a large and massive animal, the head and body being 4 feet 6 inches long without the tail. It is found all over Africa from Abyssinia and Senegal southwards. A few are left in Natal. It is believed to be the same as the cave-hyæna of Europe. By day it lives much in the holes of the aard-vark (ant-bear); by night it goes out, sometimes in small bands, to seek food. It has a loud and mournful howl,



Photo by A. S. Rudland & Sons

SPOTTED HYÆNA

The jaws of the hyæna are specially made for cracking bones. They will smash the thigh-bone of a buffalo



Photo by L. Medland, F.Z.S.]

[North Finchley

STRIPED HYÆNA

This is the hyæna of Northern Africa, Palestine, and India

calm. There was nothing to disturb the stillness. I was awakened from sleep by a light touch on my sleeve, and my attention was directed by my wife to some object that had just quitted our tent. I took my rifle from beneath the mat on which I lay, and, after waiting for a few minutes sitting up in bed, saw a large form standing in the doorway preparatory to entering. Presently it walked in cautiously, and immediately fell dead, with a bullet between its eyes. It proved to be a very large hyæna, an old and experienced depredator, as it bore countless scars of encounters with other strong biters of its race."

The STRIPED HYÆNA is found in India as well as in Africa. In portions of Abyssinia these animals are so numerous that on the Nile tributaries Sir Samuel Baker used to hear them crackling the bones after supper every night just as they had been thrown by the Arabs within a few feet of the deserted table. In this way they are useful scavengers.

THE AARD-WOLF

This small African hyæna-like creature stands in a family by itself. The animal is like a small striped hyæna, with a pointed muzzle, longer ears, and a kind of mane. It is common all through South and East Africa, where it lives on carrion, white ants, and lambs and kids. It has not the strong jaws and teeth of the dog or hyæna family. The colonists commonly hunt and kill it with fox-terriers.



Photo by A. S. Rudland & Sons

AARD-WOLF

The aard-wolf stands in a family by itself. It is allied to the hyænas, but is a far feebler animal

of its jaws; but they will leave bones unbroken which a hyæna will crack in halves. Its powers of digestion are unlimited. It will swallow and digest a knuckle-bone without giving it a crunch, and will crack the thigh-bone of a buffalo to obtain the marrow, and swallow either end immediately after. . . . I remember that once a hyæna came into our tent at night. But this was merely a friendly reconnaissance, to see if any delicacy, such as our shoes, or a saddle, or anything that smelt of leather, were lying about. It was bright moonlight, and the air was



Photo by New York Zoological Society

YOUNG GREY WOLF

The grey wolf of North America, which once preyed mainly on young bison calves, is now a formidable enemy to the increasing flocks of sheep and herds of cattle in the north and west

CHAPTER V

THE DOG FAMILY



Photo by Scholastic Photo, Co., Parson's Green

A GROWING CUB

Note how the wolf cub develops the long pasterns, large feet, and long jaw before its body grows in proportion

THE tribe now treated is called the Dog Family, and rightly so, for our domestic dogs are included in the group, which comprises the Wolves, Dogs, Jackals, Wild Dogs, and Foxes. Their general characters are too familiar to need description, but it should be noted that the foxes differ from the dogs in having contracting pupils to the eye (which in bright sun closes like a cat's to a mere slit), and some power of climbing. The origin of the domestic dog is still unsettled.

THE WOLF

This great enemy of man and his dependents—the creature against the ravages of which almost all the early races of Europe had to combine, either in tribes, villages, or principalities, to protect their children, themselves, and their cattle—was formerly found all over the northern hemisphere, both in the Old and New Worlds. In India it is rather smaller, but equally fierce and cunning, though, as there are no long winters, it does not gather in packs. It is still so common in parts of the Rocky Mountains that the cattle and sheep of the ranch-holders and wild game of the National Yellowstone Park suffer severely. In Switzerland the ancient organisations of wolf clubs in the cantons are still maintained. In Brittany the Grand Louvetier is a government official. Every very hard winter wolves from the Carpathians and Russia move across the frozen rivers of Europe even to the forests of the Ardennes and of Fontainebleau. In Norway they ravage the reindeer herds of the Lapps. Only a few years ago an artist, his wife, and servant were all attacked on their way to Budapest, in Hungary, and the man and his wife killed. The last British wolf was killed in 1680 by Cameron of Lochiel. Wolves are common in Palestine, Persia, and India.

Without going back over the well-known history of the species, we will give some anecdotes of the less commonly known exploits of these fierce and dangerous brutes. Mr. Kipling's "Jungle Book" has given us an "heroic" picture of the life of the Indian wolves. There is a great deal of truth in it. Even the child-stealing by wolves is very probably a fact, for native opinion is unanimous in crediting it. Babies laid down by their mothers when working in the fields are constantly carried off and devoured by them, and stories of their being spared and suckled by the she-wolves are very numerous.

Indian wolves hunt in combination, without assembling in large packs. The following is a remarkable instance, recorded by General Douglas Hamilton: "When returning with a friend from a trip to the mountain caves of Ellora, we saw a herd of antelope near a range of low rocky hills; and as there was a dry nullah, or watercourse, we decided on having a stalk. While creeping up the nullah, we noticed two animals coming across the plain on our left. We took them at first for leopards, but then saw that they were wolves. When they were about 500 yards from



Photo by Ottomar Anschütz, Berlin.

WOLF FROM CENTRAL EUROPE.

The last persons recorded as killed by these animals were an artist and his wife travelling in Hungary.

the antelope, they lay down quietly. After about ten minutes or so, the smaller of the two got up and trotted off to the rocky hills, and suddenly appeared on the ridge, running backwards and forwards like a Scotch collie dog. The larger wolf, as soon as he saw that the antelope were fully occupied in watching his companion, got up and came as hard as he could gallop to the nullah. Unfortunately he saw us and bolted; and his companion, seeing there was something wrong, did the same. Now, it is evident that these wolves had regularly planned

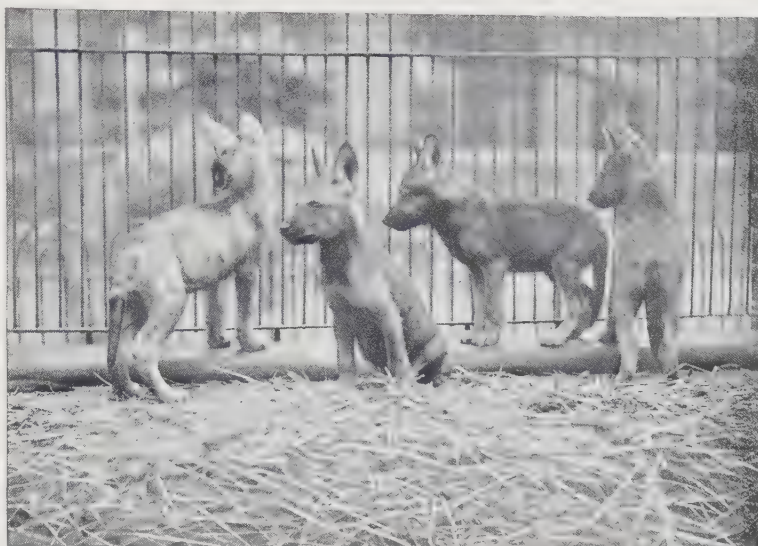


Photo by Scholastic Photo. Co.]

[Parson's Green

WOLF CUBS

These are evidently the foster-brothers of Romulus and Remus

this attack. One was to occupy the attention of the antelope, the other to steal up the water-course and dash into the midst of them. At another time a brother-officer of mine was stalking a herd of antelope which were feeding down a grassy valley, when suddenly a wolf got up before him, and then another and then another, until fourteen wolves rose out of the grass. They were extended right across the valley in the shape of a fishing-net or jelly-bag, so that as soon as the herd had got well into the jelly-bag they would have rushed on the antelope, and some must have fallen victims to their attack." They have been known to join in the chase of antelopes by dogs. Captain Jackson, of the Nizam's service, let his dogs course an antelope fawn. A wolf jumped up, joined the dogs, and all three seized the fawn together. He then came up, whipped off the dogs and the wolf, and secured the fawn, which did not seem hurt. The wolf immediately sat down and began to howl at the loss of his prey, and in a few moments made a dash at the officer, but when within a few yards thought better of it, and recommenced howling. This brought another wolf to his assistance. Both howled and looked very savage, and seemed inclined to make another dash at the antelope. But the horse-keepers came up, and the wolves retired.

The Indian wolf, if a male, stands about 26 inches high at the shoulder. The length of head and body is 37 inches; tail, 17 inches.

The same species practically haunts the whole of the world north of the Himalaya. It varies in colour from almost black to nearly pure white. In the Hudson Bay fur-sales every variety of colour between these may be seen, but most are of a tawny brindle. The male grows to a very great size. One of the largest ever seen in Europe was for years at the London Zoo. It stood 6 feet high when on its hind legs, and its immense head and jaws seemed to occupy one-third of the space from nose to tail. Horses are the main prey of the NORTHERN WOLF. It will kill any living creature, but horse-flesh is irresistible. It either attacks by seizing the flank and throwing the animal, or bites the hocks. The biting power is immense. It will tear a solid mass of flesh at one grip from the buttock of a cow or horse. In the early days of the United States, when Audubon was making his first trip up the head-waters of the Missouri, flesh of all kinds was astonishingly abundant on the prairies. Buffalo swarmed, and the Indians had any quantity of buffalo meat for the killing. Wolves of very large size used to haunt the forts and villages, and were almost tame, being well fed and comfortable. Far different was the case even near St. Petersburg at the same period. A traveler in 1840 was chased by a pack of wolves so



Photo by L. Medland, F.Z.S.]

[North Finchley

WHITE WOLF

White wolves are quite common in North America. Recently two white wolves were brought to the Zoological Gardens from Russia

unfaltering gallop. Seldom in these days does a human life fall victim; but in very hard winters sledge-horses are often killed, and now and then a peasant. Rabies is very common among wolves. They then enter the villages, biting and snapping at every one. Numbers of patients are sent yearly from Russia and Hungary to the Pasteur Institutes, after being bitten by rabid wolves. In Livonia, in 1823, it was stated that the following animals had been killed by wolves: 15,182 sheep, 1,807 oxen, 1,841 horses, 3,270 goats, 4,190 pigs, 703 dogs, and numbers of geese and fowls. They followed the Grand Army from Russia to Germany in 1812, and restocked the forests of Europe with particularly savage wolves. It is said that in the retreat from Moscow twenty-four French soldiers, with their arms in their hands, were attacked, killed, and eaten by a pack of wolves.

From very early times special breeds of dogs have been trained to guard sheep against the attacks of wolves. Some of these were intended to defend the flock on the spot, others to run down the wolves in the open. The former are naturally bred to be very large and heavy; the latter, though they must be strong, are light and speedy. Of the dogs which guard the flocks several races still survive. Among the most celebrated are those of Albania and the mountainous parts of Turkey, and the wolf-dogs of Tibet, generally called Tibetan Bloodhounds. The Tartar shepherds on the steppes near the Caucasus also keep a very large and ferocious breed of dog. All these are of the mastiff type, but have long, thick hair. When the shepherds of Albania or Mount Rhodope are driving their flocks along the mountains to the summer pastures, they sometimes travel a distance of 200 miles. During this march the dogs act as flankers and

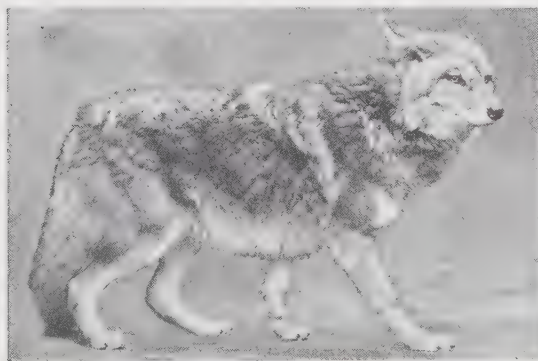


Photo by Scholastic Photo, Co.]

[Parson's Green

PRAIRIE-WOLF, OR COYOTE

This is the small, grey, thickly furred species found on the prairies

closely that when the sledge-horses reached the post-house and rushed into the stable, the doors of which were open, seven of the wolves rushed in after them. The driver and traveler leaped from the sledge just as it reached the building, and horses and wolves rushed past them into it. The men then ran up and closed the doors. Having obtained guns, they opened the roof, expecting to see that the horses had been killed. Instead all seven wolves were slinking about beside the terrified horses. All were killed without resistance.

In Siberia and Russia the wolves in winter are literally starving. Gathering in packs, they haunt the roads, and chase the sledges with their unfaltering gallop. Seldom in these days does a human life fall victim; but in very hard winters sledge-horses are often killed, and now and then a peasant. Rabies is very common among wolves. They then enter the villages, biting and snapping at every one. Numbers of patients are sent yearly from Russia and Hungary to the Pasteur Institutes, after being bitten by rabid wolves. In Livonia, in 1823, it was stated that the following animals had been killed by wolves: 15,182 sheep, 1,807 oxen, 1,841 horses, 3,270 goats, 4,190 pigs, 703 dogs, and numbers of geese and fowls. They followed the Grand Army from Russia to Germany in 1812, and restocked the forests of Europe with particularly savage wolves. It is said that in the retreat from Moscow twenty-four French soldiers, with their arms in their hands, were attacked, killed, and eaten by a pack of wolves.

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President Theodore Roosevelt gives an interesting account of wolf-coursing in Russia, in an article contributed to "The Encyclopædia of Sport" (Lawrence & Bullen). "In Russia the sport is a science," he writes. "The princes and great landowners who take part in it have their hunting-equipages equipped perfectly to the smallest detail. Not only do they follow wolves in the open, but they capture them and let them out before dogs, like hares in a closed coursing-meeting. The huntsman follows his hounds on horseback. (These hounds are the Borzoi, white giant greyhounds, now often seen in England.) Those in Russia show signs of reversion to the type of the Irish wolf-hound, dogs weighing something like 100 lbs., of remarkable power, and of reckless and savage temper. Now three or four dogs are run together. They are not expected to kill the wolf, but merely to hold him. . . . The Borzois can readily overtake



Photo by Ottomar Anschütz]

[Berlin]

"THE WOLF WITH PRIVY PAW"

The photograph shows admirably the slinking gait and long stride of the wolf

and master partly grown wolves, but a full-grown dog-wolf, in good trim, will usually gallop away from them."

A number of these Borzoi dogs have been imported into America, and are used to course wolves in the Western States. But there professional wolf-hunters are employed to kill off the creatures near the ranches. One such hunter lives near President Roosevelt's ranch on the Little Missouri. His pack of large dogs will tear in pieces the biggest wolf without aid from the hunter. Of his own efforts in wolf-coursing he writes: "We generally started for the hunting-ground very early, riding across the open country in a widely spread line of dogs and men. If we put up a wolf, we simply went at him as hard as we knew how. Young wolves, or those which had not attained their full strength, were readily overtaken, and the pack would handle a she-wolf quite readily. A big dog-wolf, or even a full-grown and powerful she-wolf,



Photo by J. W. McLellan]

[Highbury

RUSSIAN WOLF

This is a most characteristic photograph of one of the so-called "greyhound wolves" of the Russian forests

offered an altogether different problem. Frequently we came upon one after it had gorged itself on a colt or calf. Under such conditions, if the dogs had a good start, they ran into the wolf and held him. . . . Packs composed of nothing but specially bred and trained greyhounds of great size and power made a better showing. Under favourable circumstances three or four of these dogs readily overtook and killed the largest wolf. . . . Their dashing courage and ferocious fighting capacity were marvelous, and in this respect I was never able to see much difference between the smooth and rough—the Scotch deerhound or the greyhound type."

Wolf cubs are born in April or May. The litter is from four to nine. There was one of six a few years ago at the Zoological Gardens at the Hague, pretty little creatures like collie puppies, but quarrelsome and rough even in their play. When born, they were covered with reddish-white down; later the coat became woolly and dark.

The European wolf's method of hunting when in chase of deer is by steady pursuit. Its speed is such and its endurance so great that it can overtake any animal. But there is no doubt that the favourite food of the wolf is mutton, which it can always obtain without risk on the wild mountains of the Near East, if once the guardian dogs are avoided. M. Tschudi, the naturalist of the Alps, gives a curious account of the assemblage of wolves in Switzerland in 1799. They had, as it is mentioned above, followed the armies from Russia. Having tasted human flesh, they preferred it to all other, and even dug up the corpses. The Austrian, French, and Russian troops penetrated in 1799 into the highest mountain valleys of Switzerland, and fought sanguinary battles there. Hundreds of corpses were left on the mountains and in the forests, which acted as bait to the wolves, which were not destroyed for some years.

Wolves will interbreed with dogs readily, which the red fox will not. The progeny do not bark, but howl. The Eskimo cross their dogs with wolves to give them strength.

THE COYOTE, OR PRAIRIE-WOLF

Besides the large gray wolf, a smaller and less formidable animal is common on the prairies and mountains of the northern half of the continent of America. This is the COYOTE. It takes the place of the hyæna as a scavenger, but has some of the habits of the fox. It catches birds and buck-rabbits, and feeds on insects, as well as small rodents like prairie-dogs and mice. Its melancholy howls make night hideous on the northern prairies, and it is the steady foe of all young creatures, such as the fawns of prong-horned antelope and deer. Its skin, like that of most northern carnivora, is thick and valuable for fur wraps. The coyotes assemble in packs like jackals.

In the National Park in the Yellowstone Valley gray wolves and coyotes are the only

animals which it is absolutely necessary to destroy. As the deer and antelope and other game increased under State protection, the wolves and coyotes drew towards a quarter where there were no hunters and a good supply of food. It was soon found that the increase of the game was checked. The coyotes used to watch the hinds when about to drop their calves, and usually succeeded in killing them. The large gray wolves killed the hinds themselves, and generally made life most unpleasant for the dwellers in this paradise. Orders were issued to kill off all the wolves by any means. ~~Poison~~ was found to be the best remedy; but in the winter, when all the game descended into the valleys, the wolves found so much fresh food in the carcases of the animals they killed for themselves that they would not eat very eagerly of the poisoned baits. The coyotes were killed off fairly closely, as they are less able to obtain living prey; but the gray wolves are constantly reinforced from the mountains, and are a permanent enemy to be coped with.

A curious instance of change of habit in wolves on the American prairies was recently noted in the *Spectator*. Formerly they followed the caravans; now they come down to the great transcontinental railways, and haunt the line to obtain food. Each train which crosses the prairie is, like a ship, full of provisions. Three meals a day take place regularly, and these are not stinted. The black cooks throw all the waste portions—beef-bones, other bones, stale bread, and trimmings—overboard. The wolves have learnt that the passing of a train means food, and when they hear one they gallop down to the line, and wait like expectant dogs in the hope of picking up a trifle. The coyotes come close to the metals, and sit like terriers, with their sharp noses pricked up. The big gray wolves also appear in the early morning, standing on the snow, over which the chill wind of winter blows, gaunt and hungry images of winter and famine.



Photo by Ottomar Anschütz

[Berlin

WOLF OF THE CARPATHIANS

This wolf is a shorter and more heavily built specimen than the Russian wolf on the previous page



Photo by L. Medland, F.Z.S.]

[North Finchley

INDIAN WOLF

This photograph shows the Indian wolf alarmed. It has a reputation for stealing children as well as killing cattle

first sound the wolf began to tremble, erected its fur, dropped its tail between its legs, and crept uneasily across its den. As the sound grew louder and more intense, the wolf trembled so violently, and showed such physical evidence of being dominated by excessive fright, that the keeper begged that the experiment might be discontinued, or the creature would have a fit. A large European wolf is described in "Life at the Zoo" as having exhibited its dislike of the music in a



Photo by Ottomar Anshütz]

[Berlin

WOLF'S HEAD

A very fine study of the head, jaws, and teeth of a female wolf. The head of the male is much larger

Some years ago experiments were made at the Regent's Park Zoological Gardens to ascertain if there were any foundation for the old legends that wolves feared the sound of stringed instruments such as the violin. Every one will remember the story of the fiddler pursued by wolves. It is said that as the pack overtook him he broke a string of his instrument, and that the sudden noise of the parting cord caused the pack to stand still for a minute, and so enabled him to reach a tree, which he climbed. Further, that when he improved on the hint so given, and played his fiddle, the wolves all sat still; when he left off, they leapt up and tried to reach him. Experiments with the Zoo wolves showed that there was no doubt whatever that the low minor chords played on a violin cause the greatest fear and agitation in wolves, both European and Indian. The instrument was first played behind the den of an Indian wolf, and out of sight. At the

different way. It set up all its fur till it looked much larger than its ordinary size, and drew back its lips until all the white teeth protruding from the red gums were shown. It kept silent till the violin-player approached it; then it flew at him with a ferocious growl, and tried to seize him.

There are instances of wolves having been quite successfully tamed, and developing great affection for their owners. They are certainly more dog-like than any fox; yet even the fox has been tamed so far as to become a domesticated animal for the lifetime of one particular individual. An extraordinary instance of this was lately given in *Country Life*, with a photograph of the fox. It was taken when a cub, and brought up at a large country house with a number of dogs.

Among these were three terriers, with which it made friends. There were plenty of wild foxes near, some of which occasionally laid up in the laurels in a shrubbery not far from the house. These laurels were, in fact, a fairly safe find for a fox. It was the particular sport of the terriers to be taken to "draw" this bit of cover, and to chase out any fox in it. On these expeditions the tame fox invariably accompanied them, and took an active part in the chase, pursuing the wild fox as far as the terriers were able to maintain the hunt.

In Central Asia the wolves lie out singly on the steppes during the summer, and feed on the young antelopes and the lambs and kids of the Tartar's flocks. The Kirghiz organise wolf-killing parties, to which as many mounted men and dogs come as can be brought together. In order to aid the dogs, the Tartars often employ eagles trained to act like falcons, which sit on the arm of the owner. As the eagle is too heavy to be carried for any time in this way, a crutch is fastened to the left side of the saddle, on which the bearer of the falcon rests his arm. When a wolf is sighted, the eagle is loosed, and at once flies after the wolf, and overtakes it in a short time, striking at its head and eyes with its talons, and buffeting it with its wings. This attack so disconcerts the wolf that it gives time for the dogs to come up and seize it.

The habits of the Siberian wolf are rather different from those in West Russia, and the settlers and nomad Tartars of Siberia are far more adventurous and energetic in defending themselves against its ravages than the peasants of European Russia. Being mounted, they also have a great advantage in the pursuit. The result is that Siberian wolves seldom appear in large packs, and very rarely venture to attack man. Yet the damage they do to the flocks and herds which constitute almost the only property of the nomad tribes is very severe.

Both the Russians and Siberians believe that when a she-wolf is suckling her young she carefully avoids attacking flocks in the neighbourhood of the place where the cubs lie, but that if she be robbed of her whelps she revenges herself by attacking the nearest flock. On this account the Siberian peasants rarely destroy a litter, but hamstring the young wolves and then catch them when partly grown, and kill them for the sake of their fur. Among the ingenious methods used for shooting wolves in Siberia is that of killing them from sledges. A steady horse is harnessed to a sledge, and the driver takes his seat in front as usual. Behind sit two men armed with guns, and provided with a small pig, which is induced to squeak often and loudly. In the rear of the sledge a bag of hay is trailed on a long rope. Any wolf in the forest near which hears the pig concludes that it is a young wild one separated from its mother. Seeing the hay-bag trailing behind the sledge in the dusk, it leaps out to seize it, and is shot by the passengers sitting on the back seat of the sledge.



Photo by Scholastic Photo. Co.]

RUSSIAN WOLF

[Parson's Green

Note the expression of fear and ferocity on the face of this wolf; also the enormously powerful jaws



Photo by L. Medland, F.Z.S.]

[North Finchley

NORTH AFRICAN JACKAL*This is the common jackal of Cairo and Lower Egypt*

In Africa two species are found—the BLACK-BACKED JACKAL and the STRIPED JACKAL; the former is the size of a large English fox. The young jackals are born in holes or earths; six seems to be the usual number of puppies. They have nearly always a back door by which they can escape; this is just large enough for the puppies to squeeze through, whatever their size. When fox-terriers are put into the earth, the jackal puppies fly out of their back doors, through which, as a rule, the terriers are unable to follow them. Should there be no one outside, the puppies race out on to the veldt as hard as they can go. This jackal is terribly destructive to sheep and lambs in the Colony. A reward of \$1.80 per tail is paid to the Kaffirs for killing them. The SIDE-STRIPED JACKAL is a Central African species, said to hunt in packs, to interbreed with domestic dogs, and to be most easily tamed.

Both in India and South Africa the jackal has been found to be of some service to the white man by providing him with a substitute for the fox to hunt. It has quite as remarkable powers of endurance as the fox, though it does not fight in the same determined way when the hounds overtake it. But it is not easy to estimate the courage of a fox when in difficulties. The writer has known one, when coursed by two large greyhounds, to disable both almost instantaneously. One was bitten across the muzzle, the other through the foot. The fox escaped without a bite from either. In India the hounds used are drafts from English packs. The hot weather does not suit them, and they are seldom long-lived; but while they are in health they will run a jackal across the

THE JACKAL

Of the Wild Canine Family, the JACKAL is the next in numbers and importance to the wolves. Probably in the East it is the most numerous of any. In India, Egypt, and Syria it regularly haunts the outskirts of cities, and lives on refuse. In the Indian plains wounded animals are also killed by the jackals. At night the creatures assemble in packs, and scour the outskirts of the cities. Horrible are the howlings and weird the cries of these hungry packs. In Ceylon they live in the hills and open country like foxes, and kill the hares. When taken young jackals can be tamed, and have all the manners of a dog. They wag their tails, fawn on their master, roll over and stick up their paws, and could probably be domesticated in a few generations, were it worth while. They eat fruits and vegetables, such as melons and pumpkins, eagerly.



Photo by A. S. Rudland & Sons

INDIAN JACKAL

This Indian jackal might be sitting for his portrait in Mr. Rudyard Kipling's tale of the "undertakers"—the jackal, alligator, and adjutant

Indian plains as gaily as they would a fox over the Hampshire Downs. The meet is very early in the morning, as the scent then lies, and riding is not too great an exertion. The ground drawn is not the familiar English covert, but fields, watercourses, and old buildings. A strong dog-jackal goes away at a great pace, and as the ground is open the animal is often in view for the greater part of the run; but it keeps well ahead of the hounds often for three or four miles, and if it does not escape into a hole or ruin is usually pulled down by them. Major-General R. S. S. Baden-Powell has written and illustrated an amusing account of his days with the fox-hounds of South Africa hunting jackals. The local Boer farmers, rough, unkempt, and in ragged trousers, used to turn up smoking their pipes to enjoy the sport with the smartly got-up English officers. When once the game was found, they were just as excited as the Englishmen, and on their Boer ponies rode just as hard, and with perhaps more judgment.



Photo by A. S. Rudland & Sons

MANED WOLF

A South American animal; its coat is a chestnut-red



Photo by L. Medland, F.Z.S.]

[North Finchley

TURKISH JACKAL

This Jackal is common in both Turkey in Europe and in Asia. Near Constantinople it feeds largely on the bodies buried in the cemeteries at Scutari

Jackals are said to be much increasing in South Africa since the outbreak of the war. The fighting has so far arrested farming operations that the war usually maintained on all beasts which destroy cattle or sheep has been allowed to drop. In parts of the more hilly districts both the jackal and the leopard are reappearing where they have not been common for years, and it will take some time before these enemies of the farmer are destroyed.

THE MANED WOLF

This is by far the largest of several peculiar South American species of the Dog Family which we have not room to mention. It occurs in Paraguay and adjoining regions, and is easily distinguishable by its long limbs and large ears. It is chestnut-red in colour, with the lower part of the legs black, and is solitary in its habits.



Photo by A. S. Rudland & Sons

WILD DOG

These animals range from the plains of India and Burma to the Tibetan Plateau and Siberia. They hunt in small packs, usually by day, and are very destructive to game, but seldom attack domestic animals

kills the farmers' cattle and sheep and the largest antelopes. A pack has been seen to kill and devour to the last morsel a large buck in fifteen minutes. Drummond says: "It is a marvelous sight to see a pack of them hunting, drawing cover after cover, their sharp bell-like note ringing through the air, while a few of the fastest of their number take up their places along the expected line of the run, the wind, the nature of the ground, and the habits of the game being all taken into consideration with wonderful skill." The same writer says that he has seen them dash into a herd of cattle feeding not a hundred yards from the house, drive out a beast, disappear over a rising ground, kill it, and pick its bones before a horse could be saddled and ridden to the place.



Photo by Scholastic Photo. Co.]

DINGO

[Parson's Green

The wild dog of Australia. It was found there by the first discoverers, but was probably introduced from elsewhere

THE WILD DOG OF AFRICA,
OR CAPE HUNTING-DOG

This is a most interesting creature, differing from the true dogs in having only four toes on both fore and hind feet, and in being spotted like a hyæna. These dogs are the scourge of African game, hunting in packs. Long of limb and swift of foot, incessantly restless, with an overpowering desire to snap and bite from mere animal spirits, the Cape wild dog, even when in captivity and attached to its master, is an intractable beast. In its native state it

THE INDIAN WILD DOGS

Mr. Rudyard Kipling's stories of the "Dhole," the red dogs of the Indian jungle, have made the world familiar with these ferocious and wonderfully bold wild dogs. There is very little doubt that they were found in historic times in Asia Minor. Possibly the surviving stories of the "Gabriel hounds" and other ghostly packs driving deer alone in the German and Russian forests, tales which remain even in remote parts of England, are a survival of the days when the wild dogs lived in Europe. At present there is one species of long-haired wild dog in West Central Siberia. These dogs

Photo by Kerry & Co.]



DINGOES

The destruction done to the flocks of the settlers by the dingoes caused the latter to combine and almost to destroy these wild dogs

[Sydney



Photo by A. S. Rudland & Sons

CAPE HUNTING-DOG

This animal hunts in packs. It is very active and most destructive to large game of many kinds

killed nearly all the deer in the large forests near Omsk some years ago. Across the Himalaya there are several species, one of them as far east as Burma; but the most famous are the RED DOGS OF THE DECCAN. They frequent both the jungles and the hills; but their favourite haunt is the uplands of the Indian Ghats. They are larger than a jackal, much stronger, and hunt in packs. They have only ten teeth on each side, instead of eleven, as in the other dogs and foxes. There is no doubt that these fierce hunting-dogs actually take prey from the tiger's jaws, and probably attack the tiger itself. They

will beset a tiger at any time, and the latter seems to have learnt from them an instinctive fear of dogs. Not so the leopard, which, being able to climb, has nothing to fear even from the "dhole." A coffee-planter, inspecting his grounds, heard a curious noise in the forest bordering his estate. On going round the corner of a thick bush, he almost trod on the tail of a tiger standing with his back towards him. He silently retreated, but as he did so he saw that there was a pack of wild dogs a few paces in front of the tiger, yelping at him, and making the peculiar noise which had previously attracted his attention. Having procured a rifle, he returned with some of his men to the spot. The tiger was gone, but they disturbed a large pack of wild dogs feeding on the body of a stag. This, on examination, proved to have been killed by the tiger, for there were the marks of the teeth in its neck. The dogs had clearly driven the tiger from his prey and appropriated it. The dread of the tiger for these wild dogs was discovered by the sportsmen of the Nilgiri Hills, and put to a good use. They used to collect scratch packs and hunt up tigers in the woods. The tiger, thinking they were the dreaded wild pack, would either leave altogether or scramble into a tree. As tigers never do this ordinarily, it shows how wild dogs get on their nerves.

Several South American wild dogs and foxes are included in the series with the wolves and jackals. Among these are AZARA'S DOG and the RACCOON-DOG. These are commonly called foxes, though they have wolf-like skulls.

THE DINGO

The only non-marsupial animal of Australia when the continent was discovered was the WILD DOG, or DINGO. Its origin is not known; but as soon as the settlers' flocks and herds began to increase its ravages were most serious, though doubtless some of the havoc with which it was accredited was due in a great measure to runaways from domestication. Anyhow, in the dingo the settlers found the most formidable enemy with which they had to contend, and vigorous measures were taken to reduce their numbers and minimise their ravages, so that by now they are nearly exterminated in Van Diemen's Land and rare on the mainland of Australia.

It is a fine, bold dog, of considerable size, generally long-coated, of a light tan colour, and with pricked-up ears. It is easily tamed, and some of those kept in this country have made affectionate pets. Puppies are regularly bred and sold at the Zoological Gardens. The animal has an elongated, flat head which is carried high; the fur is soft, and the tail bushy. In the wild state it is very muscular and fierce.

THE FOXES

FOXES form a very well-marked group. They have very pointed muzzles, strong though slightly built bodies, very fine thick fur, often beautifully coloured and very valuable, bushy tails, pricked-up ears, and eyes with pupils which contract by day into a mere slit. They are quite distinct from dogs (although wolves are not), and will not interbreed, though stories are told to the contrary. The smell of a fox is disgusting to a dog, and quite sufficient to distinguish it.

If the present writer takes a simpler view of the kinds and species of foxes than that adopted by many naturalists, he must plead to a study of the subject on slightly different lines than those usually followed. The skins of all foxes are valuable, some more than others. But they are sent in hundreds of thousands, and from all parts of the northern hemisphere, to London to the great fur-sales. There these differences can be studied as they can be studied



Photo by C. Reid]

FOX CUBS

[Wishaw, N. B.

Fox cubs are born from March 25 till three weeks later, the time when young rabbits, their best food, are most numerous

nowhere else. As the habits and structure of foxes are much alike, allowing for differences of climate, and the discrepancies in size, not more than can be accounted for by abundance or scarcity of food, it seems pretty certain that these animals are some of the few, almost alone among mammals, showing almost every variety of colouring, from black to white, from splendid chameleon-red to salmon-pink, and many exquisite shades of brown, gray, and silver. At the Hudson Bay Company's sales you may see them all, and trace the differences and gradations over whole continents. The most important are those of North America. There the RED CANADIAN Fox, of a ruddier hue than brown, shades off into the yellow and gray CROSS Fox of farther north. But of these there are many varieties. Then farther north still comes an area where red foxes, cross foxes, and black foxes are found. The black fox, when the fur is slightly sprinkled with white, is the famous SILVER FOX. This and the black fox are also found in North Siberia and Manchuria. Farthest north we find the little stunted ARCTIC FOXES. In the Caucasus and Central Asia large yellowish-red foxes live, and in Japan and China a very bright red variety. A small gray fox lives in Virginia, and is hunted with hounds descended from packs

taken out before the American Revolution. India has its small DESERT-FOXES ("the little foxes that eat the grapes") and the BENGAL FOX.

The value of the foxes as fur-bearing animals is immense. Only white, blue, and black skins seem to be appreciated here. The black fox has been known to fetch \$750 a skin. But in the East, from Asia Minor to China, red, gray, and yellow fox skins are the lining of every rich man's winter wraps. Splendid mixed robes are made by the Chinese by inserting portions of cross fox-skins into coats of cut sable, giving the idea that it is the fur of a new animal.

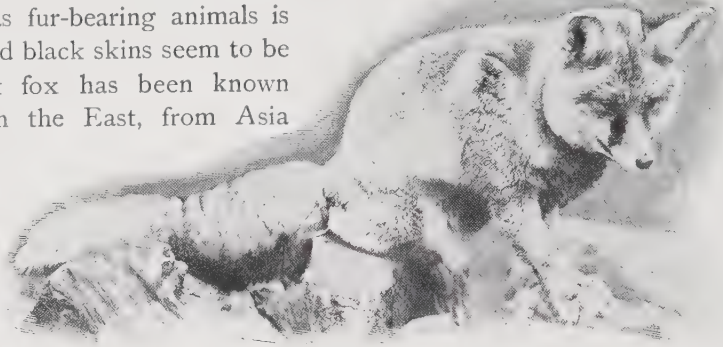


Photo by G. W. Wilson & Co., Ltd.]

MOUNTAIN-FOX

The COMMON FOX, the foundation or type of all the

In hilly countries the fox becomes a powerful and destructive animal, killing not only game but lambs

above, is the best known carnivorous animal in this country. Abroad its habits do not greatly differ, except that, not being hunted much with hounds, it is less completely nocturnal. It drops its young in an earth early in April. Thither the vixen carries food till late in June, when the cubs come out, and often move to a wood or a corn-field. There they are still fed, but learn to do a little on their own account by catching mice and moles. By late September the hounds come cub-hunting, partly to kill off superfluous foxes, partly to educate the young hounds, and to teach the foxes to fear them and to make them leave cover easily. Four or five cubs in a litter are commonly seen. The distance which a fox will run is extraordinary. The following is a true account of one of the most remarkable runs ever known. The hounds were those of Mr. Tom Smith, master of the Hambledon Hunt. He was the man of whom another famous sportsman said that if he were a fox he should prefer to be hunted by a pack of hounds rather than by Tom Smith with a stick in his hand. The fox was found in a cover called Markwells, at one o'clock in the afternoon in December, near Petersfield. It crossed into Sussex, and ran into an earth in Grafham Hill a little before dark. The fox had gone twenty-seven miles. The hounds had forty miles to go back to kennel that night, and three only found their way home four days afterwards. Dog-foxes assemble in considerable numbers



Photo by C. Reid]

[Wishaw, N. B.]

LEICESTERSHIRE FOX

when a vixen is about in spring, and at all times common foxes are sociable creatures, though not actually living in societies. Sometimes as many as five or six are found in a single earth. Two years ago five foxes and a badger were found in one near Romford. They eat mice, beetles, rats, birds, game, poultry, and frogs. Their favourite food is rabbits. If there are plenty of these, they will not touch other game. They hunt along the railway-lines for dead birds killed by the telegraph-wires. In the New Forest they also go down to the shore and pick up dead fish. One in the writer's possession was shot when



AMERICAN GRAY FOX.
(*Urocyon cinereo-argenteus*).
♂ Life-size.

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Photo by Ottomar Anschütz

[Berlin]

TOO DIFFICULT!

Foxes can easily climb trees with small projecting branches. One was found 37 feet up a tree in Savernake Forest; but a branchless stump such as that here shown no fox could climb



Photo by Scholastic Photo, Co.]

In summer

ARCTIC FOX

Changing his coat

[Parson's Green

In winter

The Arctic Fox is one of the few animals showing different phases of colour, some being blue at all seasons, while others are white in winter and mottled brownish in summer

carrying away a lamb from a sheepfold near the cliffs of Sidmouth, in Devon. The shepherd thought it was a marauding dog, and lay in wait with a gun.

THE ARCTIC FOX

The ARCTIC FOX is somewhat different in habits from others. It is also much smaller than the red foxes. Its fur is almost as soft as eiderdown, and so thick that the cold does not penetrate. In winter the whole coat changes colour, not gradually, but in patches. At the same time a dense growth of under-fur comes up on the body. In summer this is shed in patches, almost like loose felt. The foxes live in colonies, but are so hard put to it for food in the winter that they desert their homes to gather round whaling-ships or encampments. There they steal everything edible, from snow-shoe-thongs to seal-flesh. Blue foxes are bred and kept for the sake of their fur on some of the islands in Bering Sea. They are fed on the flesh of the seals killed on the neighbouring islands, and are, like them, killed when their coat is in condition.

THE FENNECS

Africa has a group of small foxes of its own. They have very large ears and dark eyes. Some of them Maholis and other Several are not more long; they are a but the eyes are very

The COMMON over the whole of food is dates and but it is also fond eat mice and insects. original hero of the and the grapes. fennec, which is the SILVER FOX, is Cape to as far It is 23 inches mainly on insects



Photo by A. S. Rudland & Sons

FENNEC-FOX

Remarkable for the great size of the ears. An African species. Its sense of hearing is probably very acute

remind us of the large-eyed lemuroids. than 9 or 10 inches whitish-khaki colour, dark and brilliant.

FENNEC is found Africa. Its favourite any sweet fruit, of eggs, and will It is probably the story of the fox The large-eared sometimes called found from the north as Abyssinia. long, and lives and fruit.

DOMESTIC DOGS

BY C. H. LANE

THE DOG, almost without exception, shows a marked liking for the society of human beings, and adapts itself to their ways more than any other animal.

Fox-, Stag-, and Hare-hounds—the latter better known as Harriers and Beagles—have many points in common, much beauty of shape and colour, and great suitability for their work, though differing in some other particulars.

Another group—Greyhounds, Whippets, Irish Wolf-hounds, Scottish Deer hounds, all of which come under the category of Gaze-hounds, or those which hunt by sight—are built for great speed, to enable them to cope with the fleet game they pursue. In the same group should be included the BORZOI, or Russian Wolf-hound, now very popular in this country, with something of the appearance of the Scottish deer-hound about it as to shape, but with a finer, longer head, deeper body, more muscular limbs, and shaggier in the hair on body and tail.

The OTTER-HOUND is one of the most picturesque of all the hound tribe. This variety somewhat reminds one of a large and leggy Dandie Dinmont terrier, with a touch of the blood-hound, and is thought to have been originally produced from a cross between these or similar varieties.

The BLOOD-HOUND is another, with much style and beauty of shape, colour, and character about it which cannot fail to favourably impress any beholder. The matches or trials which have of late years been held in different localities have been most interesting in proving its ability for tracking footsteps for long distances, merely following them by scent, some time after the person hunted started on the trail. By the kindness of my friend Mr. E. Brough, I am able to give as an illustration a portrait of what he considers the best blood-hound ever bred.

Much valued by sportsmen with the gun are POINTERS, so called from their habit of remaining in a fixed position when their quarry is discovered, eagerly pointing in its direction until the arrival of the guns. They are most often white, with liver, lemon, or black markings; but occasionally self-colours, such as liver or black, are met with. They have been largely bred in the



Photo by F. H. Dembrey]

[Bristol

STAG-HOUND PUPPIES

This gives an interesting group of hounds in kennel



Photo by T. Fall]

[Baker Street

GREYHOUND

A typical specimen of this elegant variety

red in colour, rather higher on the leg, with narrow skulls, glossy coats, feathered legs and stern, ears set low and lying back, and lustrous, expressive eyes.

RETRIEVERS may be divided into flat-coated and curly-coated. Both are usually black, but other colours are occasionally seen. The coats of the first-named are full, but without curl in them; while the latter have their bodies, heads, legs, thighs, and even tails covered with small close curls. The eyes of both should be dark, and the ears carried closely to the sides of the head. In an article dealing with retrievers, which appeared in the *Cornhill Magazine* under the title of "Dogs which Earn their Living," the author writes: "There is not the slightest doubt that in the modern retrievers acquired habits, certainly one acquired habit, that of fetching dead and wounded game, are transmitted directly. The puppies sometimes retrieve without being taught, though with this they also combine a greatly improved capacity for further teaching. Recently a retriever was sent after a winged partridge which had run into a ditch. The dog followed it some way down the ditch, and presently came out with an old rusty tea-kettle, held in its mouth by the handle. The kettle was taken from the dog, amid much laughter; then it was found that inside the kettle was the partridge! The explanation was that the bird, when wounded, ran into the ditch, which was narrow. In the ditch was the old kettle, with no lid on. Into this the bird crept; and as the dog could not get the bird out, it very properly brought out the kettle with the bird in it. Among dogs which earn their living, these good retrievers deserve a place in the front rank." The illustration shows a good flat-coated retriever at work.

The SPANIEL group is rather large, including the English and Irish water-spaniels, the former an old-fashioned, useful sort, often liver or roan, with some white or other markings, and a good deal of curl in the coat and on the ears. His Irish brother is always some shade of liver in colour, larger in the body and higher on the leg, covered with a curly coat, except on the tail, which is nearly bare of hair, with a profusion of hair on the top of the head, often hanging down over the eyes, giving a comical appearance, and increasing his Hibernian expression. They

west of England. I have been fortunate in obtaining one of Mr. E. C. Norrish's celebrated strain as a typical specimen for illustration.

The SETTER group, which comprises three varieties, are all useful and beautiful in their way. The English are usually white, with markings or tickings of blue, lemon, or black; they are rather long and narrow in the head, with bodies and sterns well feathered, and are graceful and active movers. Gordon setters, which are always black and tan in colour, and preferred without any white, are generally larger and stronger in build than the last-named. Irish setters are more on the lines of the English, being a rich tawny



Photo by C. Reid]

[Wishaw, N. B

RETRIEVER

This represents a flat-coated retriever at work, and is remarkably true to life



BLOOD-HOUND

This photograph shows what an almost perfect blood-hound should be like

COCKERS, which are shorter in the back, higher on the leg, and lighter in weight, being usually under 25 lbs., are very popular, full of life, and very attractive in appearance.

BASSET-HOUNDS, both rough-and smooth-coated, are probably the most muscular dogs in existence of their height, with much dignity about them. In the Sporting Teams at the Royal Agricultural Hall there were some thirteen or fifteen teams of all kinds of sporting dogs, and of these a team each of rough and smooth bassets was in the first four.

DACHSHUNDS are often erroneously treated as Sporting Dogs. There are certainly not so many supporters of the breed as formerly. Their lean heads, with long hanging ears, long low bodies, and crooked fore legs, give them a quaint appearance. The colours are usually shades of chestnut-red or black and tan; but some are seen chocolate and "dappled," which is one shade of reddish brown, with spots and blotches of a darker shade all over it.

GREAT DANES, though mostly classed amongst Non-sporting Dogs, have much of the hound in their bearing and appearance. The whole-coloured are not so popular as the various shades of brindle and harlequin, but I have seen many beautiful fawns, blues, and other whole colours.

make lively, affectionate companions and grand assistants at waterfowl-shooting.

CLUMBER SPANIELS are always a creamy white, with lemon or light tan markings, and are rather slow and deliberate in their movements, but have a stylish, high-class look about them.

SUSSEX SPANIELS are also rather heavy in build and of muscular frame, but can do a day's work with most others. They are a rich copper-red in colour, with low short bodies, long feathered ears, full eyes of deep colour, and are very handsome.

BLACK SPANIELS should be glossy raven-black in colour, with strong muscular bodies on strong short legs, long pendulous ears, and expressive eyes. Good specimens are in high favour, and command long prices. I regret I cannot find room for an illustration of this breed, so deservedly popular.



ENGLISH SETTER

A typical but rather coarse specimen of a beautiful variety



Photo by E. Lander]

[Ealing

SMOOTH-COATED SAINT BERNARD

The illustration gives a capital idea of these handsome dogs

They are being bred with small natural drooping ears. One of the first I remember seeing exhibited was a large harlequin belonging to the late Mr. Frank Adcock, with the appropriate name of "Satan," as, although always shown muzzled, he required the attentions of three or four keepers to deal with him; and at one show I attended he overpowered his keepers, got one of them on the ground, tore his jacket off, and gave him a rough handling.



Photo by Fratelli Alinari]

GREAT DANE

[Florence

This shows a typical specimen of this breed, with cropped ears, which will be discontinued in show dogs

NON-SPORTING VARIETIES.

SAINT BERNARDS, although sometimes exceeding 3 feet at the shoulder, are as a rule very docile and good-tempered, and many are owned by ladies. The coat may be rough or smooth, according to taste; but either are splendid animals. They are sometimes seen self-coloured, but those with markings—shades of rich red, with white and black, for preference—are the handsomest. They are still used as "first aids" in the snow on the Swiss mountains. So far as I remember, this is the only breed of dog used for stud and exhibition for which as much as \$7,500 has been paid; and this has occurred on more than one occasion.

NEWFOUNDLANDS have regained their place in popularity, and many good blacks and black-and-whites can now be seen. Numerous cases are on record of their rendering aid to persons in danger of drowning, and establishing communication with wrecked vessels and the shore.

MASTIFFS are looked on as one of the national breeds. Their commanding presence and stately manner make them highly suitable as guards, and they are credited with much attachment and devotion to their owners. The colours are mostly shades of fawn with black muzzle, or shades of brindle. I am able to give the portrait of one of the best specimens living, belonging to Mr. R. Leadbeater.

BULL-DOGS are also regarded as a national breed. They are at present in high favour. The sizes and colours are so various that all tastes can be satisfied. Recently there has been a fancy for toy bull-dogs, limited to 22 lbs. in weight, mostly with upright ears of tulip shape. In spite of the many aspersions on their character, bull-dogs are usually easy-going and good-tempered, and are often very fastidious feeders—what fanciers call "bad doers."



[Baker Street

DACHSUND

The photograph conveys a fair idea of these quaint dogs



Photo by Kitchener Portrait Co.

DALMATIANS

All are typical, but the first is the best in quality and marking

"tricolors," are pleasing and effective. I quite hoped to give a portrait of one of the most perfect of present-day champions, belonging to H. H. the Princess de Montglyn, but could not find room.

SMOOTH COLLIES are a handsome breed, full of grace, beauty, and intelligence, and very active and lively. A favourite colour is merle, a sort of lavender, with black markings and tan and white in parts, usually associated with one or both eyes china-coloured. Specimens often win in sheep-dog trials; a bitch of mine won many such, and was more intelligent in other ways than many human beings.

OLD ENGLISH SHEEP-DOGS are a most fascinating breed, remarkably active, possessed of much endurance and resource, and very faithful and affectionate. I have often made long

ROUGH COLLIES are very graceful, interesting creatures, and stand first in intelligence among canines. They are highly popular. Several have been sold for over \$5,000, and the amounts in prize-money and fees obtained by some of the "cracks" would surprise persons not in "the fancy." A high-bred specimen "in coat" is most beautiful. The colours most favoured are sables with white markings; but black, white, and tans, known as



Photo by T. Fall

NEWFOUNDLAND

[Baker Street]

The dog shown here gives a good idea of size and character, but is not in best coat

journeys through cross-country roads accompanied by one or more of them, and never knew them miss me, even on the darkest night or in the crowded streets of a large town. The favourite colour is pigeon-blue, with white collar and markings. The coat should be straight and hard in texture. The illustration is from a portrait of one of the best bitches ever shown, belonging to Sir H. de Trafford.

DALMATIANS are always white, with black, liver, or lemon spots, the size of a shilling or less, evenly distributed over the body, head, ears, and even tail, and pure, without mixture of white. There is much of the pointer about this variety, which has long been used for sporting purposes on the continent of Europe. I can testify to their many good qualities as companions and house-dogs. To quote again from the article above mentioned: "It is commonly believed that the spotted carriage-dogs once so frequently kept in stables were about the most useless



Photo by T. Fall]

BULL-DOGS

[Baker Street

The photograph is remarkably good and characteristic of this variety

creatures of the dog kind, maintained only for show and fashion. This is a mistake. They were used at a time when a traveling-carriage carried, besides its owners, a large amount of valuable property, and the dog watched the carriage at night when the owners were sleeping at country inns. We feel we owe an apology to the race of carriage-dogs. . . . While this dog is becoming extinct, in spite of his useful qualities, other breeds are invading spheres of work in which they had formerly no part." There is only one point in which I differ from the above, and that is contained in the last sentence. There are a number of enthusiastic breeders very keen on reviving interest in this variety, and I have during the last few years had large entries to judge, so that we shall probably see more of them in the future.

POODLES are of many sizes and colours. They are very intelligent, easily taught tricks, and much used as performing dogs. They have various kinds of coats: *corded*, in which the hair hangs in long strands of ringlets; *curly*, with a profusion of short curls all over them, something



OLD ENGLISH SHEEP-DOG

This is a remarkably fine photograph of a well-known specimen of this interesting variety

BEDLINGTON TERRIERS have long been popular in the extreme north of England, and are another fighting breed. It is indeed often difficult to avoid a difference of opinion between show competitors. Their lean long heads, rather domed skulls, with top-knot of lighter hair, long pointed ears, and small dark eyes, give them a peculiar appearance. The coats, which are "lindy" in texture, should be shades of blue or liver.

Three breeds, all more or less hard in coat-texture, and grizzled in colour on heads and bodies, while tanned on other parts, are AIREDALE, OLD ENGLISH, and WELSH TERRIERS, which may be divided into large, medium, and small. The first-named make very good all round dogs; the Old English, less in number, make useful dogs, and are hardy and companionable; while Welsh terriers are much the size of a small wire-haired fox-terrier, but usually shorter and somewhat thicker in the head. I intended one of Mr. W. S. Glynn's best dogs to illustrate the last-named.

FOX-TERRIERS are both smooth- and wire-haired. Their convenient size and lively temperament make them very popular as pets and companions for both sexes and all ages. The colour is invariably white, with or without markings on head or body, or both.



MASTIFF

The photograph gives almost an ideal picture of this splendid breed, the colour being known as black-brindle

like retrievers; and *fluffy*, when the hair is combed out, to give much the appearance of fleecy wool. A part of the body, legs, head, and tail is usually shorn.

BULL-TERRIERS are now bred with small natural drooping ears, and should have long wedge-shaped heads, fine coats, and long tails. There is also a toy variety, which hitherto has suffered from round skulls and tulip ears, but is rapidly improving. I have bred many as small as 3 lbs. in weight. In each variety the colour preferred is pure white, without any markings, and with fine tapering tails.

IRISH TERRIERS are very popular, and should be nearly wholly red in colour, with long lean heads, small drooping ears, hard coats, not too much leg, and without coarseness. They make good comrades.

BLACK-AND-TAN and WHITE ENGLISH TERRIERS are built upon the same lines, differing chiefly in colour, the former being raven-black, with tan markings on face, legs, and some lower parts of the body, and the latter pure white all over. Both should have small natural drooping ears, fine glossy coats, and tapering sterns. The toy variety of the former should be a miniature of the larger, and is very difficult to produce of first-class quality.

SCOTTISH TERRIERS are very interesting, often with much "character" about them. The usual colours are black, shades of gray, or brindle, but some are seen fawn, stone-colour, and white. The ears should be carried bolt upright, the coat as hard as a badger's,



Photo by Lambert Lambert]

[Bath

DEER-HOUND

This is a capital portrait of one of the best of this graceful variety



Photo by H. Cornish]

[Crediton

POINTER

This is a young dog not yet shown, but full of quality and type



Photo by Villiers & Sons]

[Newport

SKYE TERRIER

The photograph is of a well-known winner in show form



Photo by T. Fall]

[Baker Street

CORDED POODLE

The length of the cords of which the coat is composed is clearly shown



By permission of Mrs. Hall-Walker

POMERANIAN

Probably about the best all-black Toy Pomeranian ever shown



Photo by Kitchener & Salmon]

[Bond Street

SCOTTISH TERRIER

A smart picture of one of the best of these popular dogs



Photo by G. N. Taylor]

[Cowley Road

MALTESE TOY TERRIER

A very excellent representation of one of the best specimens of the present day



Photo by E. Lander]

[Easing

BUTTERFLY-DOG

The photograph gives an excellent idea of this somewhat rare variety



Photo by T. Fall]

[Baker Street

HER MAJESTY QUEEN ALEXANDRA,
WITH CHOW AND JAPANESE SPANIELS

teeth even, small dark expressive eyes, fore legs straight, the back short. One I brought from Skye many years since I took with me when driving some miles into the country; coming back by a different route, he missed me; but on nearing my starting-point I found him posted at a juncture of four roads, by one of which I must return. He could not have selected a better position. The illustration is that of a first-rate specimen of the variety, "Champion Balmacron Thistle."

DANDIE DINMONT TERRIERS have many quaint and charming ways. They are very strongly built, being among the most muscular of the terriers, of high courage, devotedly attached to their owners, and admirably adapted for companions, being suitable for indoors or out, and at home anywhere. The colours are pepper (a sort of darkish iron-gray) and mustard (a yellowish red fawn), both with white silky hair on head, called the top-knot, and lustrous dark eyes, very gipsy-like and independent in expression.

SKYES, both PRICK- and DROP-EARED, are another Scottish breed which well deserve their popularity, as they are thorough sporting animals. The colours are chiefly shades of dark or light gray, but sometimes fawn with dark points and whites are seen. The texture of coat should be hard and weather-resisting; the eyes dark and keen in expression; bodies long, low, and well knit; legs straight in front; even mouths; tails carried gaily, but not curled over the back.

SCHIPPERKES are of Belgian origin. To those who do not know them, they are something like medium-sized Pomeranians, short of coat, but without tails. They are nearly always pure black in colour, with coats of hardish texture, fullest round the neck and shoulders, the ears standing straight up like darts, short cobby bodies, and straight legs. They make smart guards and companions.

CHOWS originally came from China, but are now largely bred here. They are square-built sturdy dogs, with dense coats, tails carried over the side, blunt-pointed ears, and rather short thick heads. They have a little of a large coarse Pomeranian, with something of an Eskimo about them, but are different from either, with a type of their own. The colour is usually some shade of red or black, often with a bluish tinge in it. One marked peculiarity is that the tongues of chows are blue-black in colour.



Photo by T. Fall]

[Baker Street

SAND-DOG

A quaint picture of a quaint variety, quite hairless, and much the colour of Castile soap

POMERANIANS can be procured of any weight from 3 to 30 lbs., and of almost every shade of colour. At present brown of various shades is much in favour, but there are many beautiful whites, blacks, blues, sables, and others. They are very sharp and lively, and make charming pets and companions. Really good specimens command high prices. The illustration is of one of the best of his colour ever seen—"Champion Pippin."

PUGS, both fawn and black, are old-fashioned favourites

very quaint and peculiar in appearance. They should have square heads and muzzles, with small ears, large protruding eyes, short thick bodies, and tails tightly curled over the back. The illustration, "Duchess of Connaught," is of a well-known winner.

MALTESE TERRIERS are very beautiful when pure bred. They have a long straight coat of silky white hair nearly reaching the ground, black nose and eyes, and the tail curled over the back of their short cobby body. Their beauty well repays the trouble of keeping them in good condition. The illustration, from a photograph taken for this article, is that of the high-class dog "Santa Klaus."

YORKSHIRE TOY TERRIERS, with their steel-blue bodies and golden-tanned faces, legs, and lower parts, and long straight coats, require skilful attention to keep in order, but are very attractive as pets.

TOY SPANIELS are very old members of the toy division, dating from or before the time of King Charles: KING CHARLES SPANIELS being black and tan; PRINCE CHARLES SPANIELS black, white, and tan; another strain, the BLENHEIM, white, with shades of reddish-tan markings on the head and body, and a spot of same colour on forehead; and the RUBY, a rich coppery red all over. They should be small and stout in size and shape, without coarseness, long in the ear, with large full protruding eyes of dark colour, a short face, a straight coat, and not leggy.

JAPANESE SPANIELS carry heavy coats, usually black, or yellow, and white in colour, shorter in the ears, which are carried more forward than in the last-named, broader in the muzzle, with nearly flat faces, dark eyes, and bushy tails carried over the back. They have very short legs, and their hair nearly reaches the ground as they walk. When I kept them they were much larger in size, but they are often now produced under 6 lbs. in weight.

PEKIN SPANIELS, the last of the toy spaniels I need mention, come from China. They should have soft fluffy coats, tails inclined to turn over the back, short faces, broad muzzles, large lustrous eyes, and a grave, dignified expression. The colour is usually some shade of tawny fawn or drab, but I have seen them black and dark brown; whatever colour, it should be without white. The illustration, Mrs. Lindsay's "Tartan Plaid," was one of the early importations.



Photo by County of Gloucester Studio, Cheltenham

PUG AND PEKINESE SPANIEL

A typical portrait of two well-known winners in these popular varieties



Photo by C. Reid

[H'ishaw, N. B.]

FOX-TERRIER

A picture full of life and go—at present odds in favour of our friend with the prickly coat

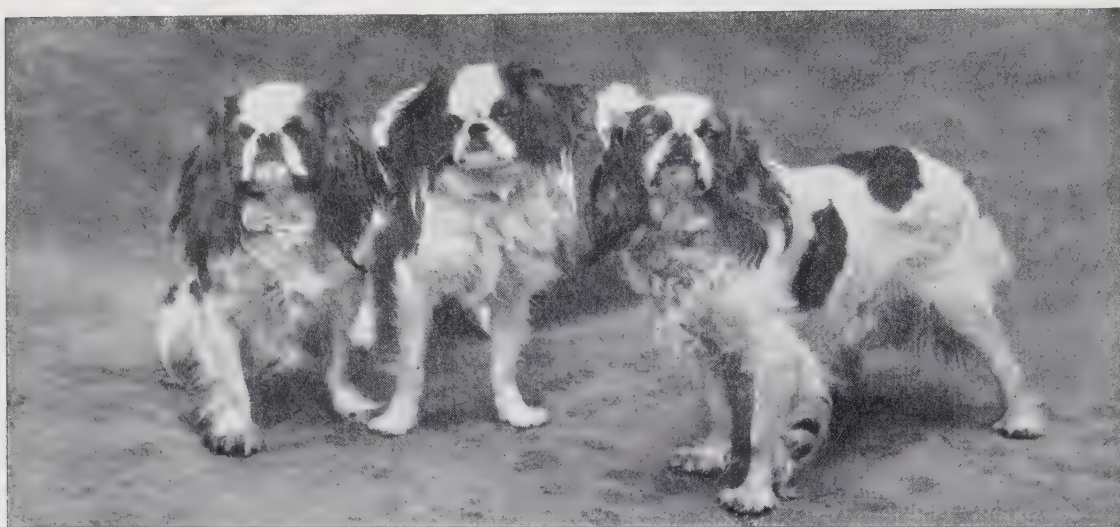


Photo by E. Landor]

[Ealing

BLENHIM AND PRINCE CHARLES SPANIELS

This little group will serve to show the appearance of these charming little pets

ITALIAN GREYHOUNDS, another old-fashioned variety of toy dog, should not exceed 12 lbs. in weight, but in my opinion are better if they are some pounds less. Much like miniature greyhounds in shape and build, they are elegant, graceful little creatures, very sensitive to cold. Shades of fawn, cream, or French gray are most common; but some are slate-blue, chestnut-red, and other tints. Of late years the breed has met with more encouragement, and there is less fear of its being allowed to die out.

GRIFFONS BRUSSELOIS have been greatly taken up the last few years. They are something like Yorkshire toy terriers in size and shape, but with a shortish harsh coat, generally of some shade of reddish brown, very short face, small shining dark eyes, heavy under-jaw, short thick body, and an altogether comical appearance. Imported specimens, particularly before reaching maturity, are often difficult to rear.

The AFRICAN SAND-DOG occasionally seen in this country (mostly at shows) is remarkable for being entirely hairless, except a few hairs of a bristly character on the top of the head and a slight tuft at the end of the tail; in colour, something in shape and terrier, and very susceptible to

Having been supplied with an will say a few words about this numbers at Constantinople and roam about unclaimed, and act as to divide the places they inhabit into leader, and resent any interference cases where they have made a debate at night; but they are rather a with a little firmness on the part of the descendants of the dogs so often probrium; and, among Eastern people now the most insulting epithet that ancient times, the dog never seems hunting and pursuing game and guardian of their flocks, herds, and



Photo by the Duchess of Bedford,
Woburn Abbey

PARIAH PUPPIES

This capital photograph of a variety seldom seen in this country will be very interesting

it is chiefly blue-black or mottled size like a coarse black-and-tan cold.

illustration of PARIAH PUPPIES, I variety, which is seen in large other Eastern cities, where they amateur scavengers; they are said districts or beats, each with its own with their authority. I have known terminated attack on travelers out cowardly race, and easily repulsed the attacked. Probably these are mentioned in Scripture with opples, to call a man "a dog" is even can be used. By the Jews, in to have been used, as with us, in wild animals, but merely as a sometimes dwellings.



Photo by Ottomar Anschütz]

COMMON BROWN BEAR

[Berlin

In Scandinavia a few still haunt the highest mountain-ridges, as here shown

CHAPTER VI

THE BEARS



Photo by Ottomar Anschütz, Berlin

AN INVITING ATTITUDE

The upright position is not natural to the brown bear. It prefers to sit on its hams, and not to stand

and the impressions in a bear's track are not unlike those of a man's footsteps. The claws are not capable of being retracted, like those of the Cats; consequently they are worn at the tips where the curve brings them in contact with the ground. Yet it is surprising what wounds these blunt but hard weapons will inflict on man—wounds resembling what might be caused by the use of a very large garden-rake. Against other animals protected by hair bears' claws are of little use. Dogs would never attack them so readily as they do were they armed with the talons of a leopard or tiger. The flesh-teeth in both jaws of the bear are

EXCEPT the great cats, no creatures have longer held a place in human interest than the BEARS. Their size and formidable equipment of claws and teeth give the touch of fear which goes with admiration. On the other hand, they do not, as a rule, molest human beings, who see them employing their great strength on apparently insignificant objects with some amusement. Except one species, most bears are largely fruit and vegetable feeders. The sloth-bear of India sucks up ants and grubs with its funnel-like lips; the Malayan bear is a honey-eater by profession, scarcely touching other food when it can get the bees' store; and only the great polar bear is entirely carnivorous. The grizzly bear of the Northern Rocky mountains is largely a flesh eater, consuming great quantities of putrid salmon in the Columbian rivers. But the ice-bear is ever on the quest for living or dead flesh; it catches seals, devours young sea-fowl and eggs, and can actually kill and eat the gigantic walrus.

Every one will have noticed the deliberate flat-footed walk of the bears. This is due partly to the formation of the feet themselves. The whole sole is set flat upon the ground,



Photo by Fratelli Alinari

[Florence]

THREE PERFORMING BEARS

Those on the right and left are Himalayan black bears. The white collar is plainly seen

unlike those of other carnivora. The teeth generally show that bears have a mixed diet. Bears appear to have descended from some dog-like ancestor, but to have been much modified.

Except the ice-bear, all the species are short and very bulky. It is said that a polar bear has been killed which weighed 1,000 lbs. It is far the largest, and most formidable in some respects, of all the carnivora. The claws of the grizzly bear are sometimes 5 inches long over the outer curve. All bears can sit upright on their hams, and stand upright against a support like a tree. Some can stand upright with no aid at all. Except the grizzly bear, they can all climb, many of them very well. In the winter, if it be cold, they hibernate. In the spring, when the shoots of the early plants come up, they emerge, hungry and thin, to seek their food. Bears were formerly common in Britain, and were exported for the Roman amphitheatres. The prehistoric cave-bears were very large. Their remains have been found in Devon, Derbyshire, and other counties.

The species inhabiting Britain during the Roman period was the common brown bear of Europe.



Photo by Ottomar Anschütz

[Berlin]

EUROPEAN BROWN BEAR

The specimen of the brown bear of Europe from which this picture was taken was an unusually light and active bear. Its flanks are almost flat

THE COMMON BROWN BEAR.

Only one species of bear is found in Europe south of the ice-line, though above it the white ice-bear inhabits Spitzbergen and the islands off the White Sea. This is the BROWN BEAR, the emblem of Russia in all European caricature, and the hero of innumerable fragments of folklore and fable, from the tents of the Lapps to the nurseries of American children. Except the ice-bear, it is far the largest of European carnivora, but varies much in size. Russia is the main home of the brown bear, but it is found in Sweden and Norway, and right across Northern Asia. It is also common in the Carpathian Mountains, in the Caucasus, and in Mount Pindus in Greece. In the South it is found in Spain and the Pyrenees, and a few are left in the Alps. The dancing-bears commonly brought to England and America are caught in the Pyrenees. The "Queen's bear," so called because its owner was allowed to exhibit it at Windsor, was one of these. But lately dancing-bears from Servia and Wallachia have also been seen about our roads and streets. In Russia the bear grows to a great size. Some have been killed of 800 lbs. in weight. The fur is magnificent in



Photo by E. Landor]

SYRIAN BEAR

[Ealing

This is the bear generally alluded to in the Old Testament

In Russia bears are shot in the following manner. When the snow falls, the bears retire into the densest thickets, and there make a half-hut, half-burrow in the most tangled part to hibernate in. The bear is tracked, and then a ring made round the cover by beaters and peasants. The shooters follow the track and rouse the bear, which often charges them, and is forthwith shot. If it escapes, it is driven in by the beaters outside. High fees are paid to peasants who send information that a bear is harboured in this way. Sportsmen in St. Petersburg will go 300 or 400 miles to shoot one on receipt of a telegram.



Photo by W. D. Dando]

[Regent's Park

LARGE RUSSIAN BROWN BEAR

The picture shows to what a size and strength the brown bear attains

winter, and in great demand for rich Russians' sledge-rugs. The finest bear-skins of all are bought for the caps of the Grenadier and Coldstream Guards. In the Alps the bears occasionally visit a cow-shed in winter and kill a cow; but as a rule the only damage done by those in Europe is to the sheep on the hills in the far north of Norway. Tame brown bears are amusing creatures, but should never be trusted. They are always liable to turn savage, and the bite is almost as severe as that of a tiger. Men have had their heads completely crushed in by the bite of one of these animals.

The brown bear, like the reindeer and red deer, is found very little modified all across Northern Asia, and again in the forests of North America. There, however, it undergoes a change. Just as the red deer is found represented by a much larger creature, the wapiti, so the brown bear is found exaggerated into the great bear of Alaska. The species attains its largest, possibly, in Kamchatka, on the Asiatic side of Bering Sea; but the Alaskan bear has the credit with sportsmen of being the largest. A skin of one of the former, brought to the sale-rooms of Sir Charles Lampson & Co., needed two men to carry it. Last spring, in the sale-rooms of the same great firm, some persons present measured the skin of an Alaskan bear which was 9 feet across the shoulders from paw to paw.

THE GRIZZLY BEAR.

This is a very distinct race of brown bear. It has a flat profile, like the polar bear; in addition it grows to a great size, is barely able to climb trees, and has the largest claws of any—they have been known to measure 5 inches along the curve. The true grizzly, which used to be found as far north as 61° latitude and south

as far as Mexico, is a rare animal now. Its turn for cattle-killing made the ranchmen poison it, and rendered the task an easy one. It is now only found in the Northern Rocky Mountains, and perhaps in North California and Nevada. Formerly encounters with "Old Ephraim," as the trappers called this bear, were numerous and deadly. It attacked men if attacked by them, and often without provocation. The horse, perhaps more than its rider, was the object of the bear. A great furrier measured a grizzly which was 9 feet long from nose to tail. The weight sometimes reaches 800 lbs. Measurements of much larger grizzly bears have been recorded, but it is difficult to credit them. On a ranche near the upper waters of the Colorado River several colts were taken by grizzly bears. One of them was found buried according to the custom of this bear, and the owner sat up to shoot the animal. Having only the old-fashioned small-bored rifle of the day, excellent for shooting deer or Indians, but useless against so massive a beast as this bear, unless hit in the head or heart, he only wounded it. The bear rushed in, struck him a blow with its paw (the paw measures a foot across), smashed the rifle which he held up as a protection, and struck the barrel on to his head. The man fell insensible, when the bear, having satisfied himself that he was dead, picked him up, carried him off, and buried him in another hole which it scratched near the dead colt. It then dug up the colt and ate part of it, and went off. Some time later the man came to his senses, and awoke to find himself "dead and buried." As the earth was only roughly thrown over him, he scrambled out, and saw close by the half-eaten remains of the colt. Thinking that it might be about the bear's dinner-time, and remembering that he was probably put by in the larder for the next meal, he hurried home at once, and did not trouble the bear again. Not so a Siberian peasant, who had much the same adventure. He had been laughed at for wishing to shoot a bear, and went out in the woods to do so. The bear had the best of it, knocked him down, and so frightfully mangled his arm that he fainted. Bruin then buried him in orthodox bear fashion; and the man, when he came to, which he fortunately did before the bear came back, got up, and made his way to the village. There he was for a long time ill, and all through his sickness and delirium talked of nothing but shooting the bear. When he got well, he disappeared into the forest with his gun, and after a short absence returned with the bear's skin!

THE AMERICAN BROWN BEAR.

The brown bear of America is closely allied to that of Europe; it was first described by Sir John Richardson, who called it the Barrenlands Bear, and noted, quite rightly, that it differed from the grizzly in the smallness of its claws. The difference in the profile is very marked—the brown bear having a profile like that of the European bear, while that of the grizzly is flat. The brown bear of North America lives largely on the fruits and berries of the northern plants, on dead deer, and on putrid fish, of which quanti-



Photo by New York Zoological Society

AMERICAN BLACK BEAR

The black bear was the species first encountered by the early settlers on the Atlantic side of America. The grizzly belongs to the Rocky Mountain region



Photo by L. Medland, F.Z.S.]

[North Finchley

YOUNG SYRIAN BEAR FROM THE CAUCASUS

This is, properly speaking, a Syrian bear, but the species is found in the Caucasus and in the Taurus Range

ties are left on the banks of the northern rivers. Whether the large brown bear of the Rocky Mountains is always a grizzly or often this less formidable race is doubtful. The writer inclines to think that it is only the counterpart of the North European and the North Asiatic brown bear. The following is Sir Samuel Baker's account of these bears. He says: "When I was in California, experienced informants told me that no true grizzly bear was to be found east of the Pacific slope.

There are numerous bears of three if not four kinds in the Rocky Mountains. These are frequently termed grizzlies; but it is a misnomer. The true grizzly is far superior in size, but of similar habits, and its weight is from 1,200 lbs. to 1,400 lbs." After giving various reasons for believing this to be a fair weight, Sir Samuel Baker adds that this weight is equivalent to that of a large cart-horse. There are certainly three Rocky Mountain bears—the Grizzly, the Brown, and the small Black Bear. There is probably also another—a cross between the black and the brown. It is ridiculous to say that the brown bears which come to eat the refuse on the dust-heaps of the hotels of the Yellowstone Park, and let ladies photograph them, are savage grizzly bears.

THE SYRIAN BEAR.

This bear, which figures in the story of Elisha, is a variety of the brown bear. It is found from the Caucasus to the mountains of Palestine, and is a smaller animal than the true brown bear, weighing about 300 lbs. The fur in summer is of a mixed rusty colour, with a whitish collar on the chest. It steals the grapes on Mount Horeb, and feeds upon ripe fruits, apples, chestnuts, corn, and the like. It is then ready to face the long winter sleep.

THE AMERICAN BLACK BEAR.

This is the smallest North American species, and perhaps the most harmless. It seldom weighs more than 400 lbs. Its coat is short and glossy, and its flesh, especially in autumn, is esteemed for food. The early backwoodsmen found it a troublesome neighbour. The bears liked Indian corn, and were not averse to a young pig. "Like the deer," says Audubon, "it changes its haunts with the seasons, and for the same reason—*viz.* the desire of obtaining food. During the spring months it searches for food in the low alluvial lands that border the rivers, or by the margins of the inland lakes. There it procures abundance of succulent roots, and of the tender, juicy stems of plants, upon which it chiefly feeds at that season. During the summer heat it enters the gloomy swamps, and passes much of its time in wallowing in the mud like a hog, and contents itself with crayfish, roots, and nettles; now and then, when hard pressed by hunger, it seizes a young pig, or perhaps a sow or calf. As soon as the different kinds of berries ripen, the bears betake themselves to the high grounds, followed by their cubs. In much-retired parts of the country, where there are no hilly grounds, it pays visits to the maize-fields, which it ravages for a while. After this the various kinds of nuts and grapes, acorns and other forest

fruits, attract its attention. The black bear is then seen wandering through the woods to gather this harvest, not forgetting to rob every tree which it comes across."

THE INDIAN SLOTH-BEAR.

Few people would believe that this awkward and ugly beast is so formidable as it is. It is the commonest Indian species, seldom eats flesh, prefers sucking up the contents of a white ants' nest to any other meal, and is not very large; from 200 lbs. to 300 lbs. is the weight of a male. But the skull and jaws are very strong, and the claws long and curved. As they are used almost like a pickaxe when the bear wishes to dig in the hardest soil, their effect upon the human body can be imagined.

Sir Samuel Baker says that there are more accidents to natives of India and Ceylon from this species than from any other animal.

Mr. Watts Jones writes an interesting account of his sensations while being bitten by one



Photo by G. Reitz.

A BROWN BEAR IN SEARCH OF INSECTS

[Wiskaw, N.B.]

The photograph shows a bear feeding on insects, possibly large ants, which he licks up from the ground, after scratching them out with his claws

of these bears: "I was following up a bear which I had wounded, and rashly went to the mouth of a cave to which it had got. It charged. I shot, but failed to stop it. I do not know exactly what happened next, neither does my hunter who was with me; but I believe, from the marks in the snow, that in his rush the bear knocked me over backwards—in fact, knocked me three or four feet away. When next I remembered anything, the bear's weight was on me, and he was biting my leg. He bit two or three times. I felt the flesh crush, but I felt no pain at all. It was rather like having a tooth out with gas. I felt no particular terror, though I thought the bear had got me; but in a hazy sort of way I wondered when he would kill me, and thought what a fool I was to get killed by a stupid beast like a bear. The chikari then very pluckily came up and fired a shot into the bear, and he left me. I felt the weight lift off me, and got up. I did not think I was much hurt. . . . The main wound was a flap of flesh torn out of the inside of my left thigh and left hanging. It was fairly deep, and I could see all the muscles working underneath when I lifted it up to clean the wound." This anecdote was sent to Mr. J. Crowther Hirst



Photo by Fratelli Alinari]

[Florence

POLAR BEARS

Though Arctic animals, polar bears can endure great heat. During a "heat wave" at Hamburg, Herr C. Hagenbeck found two of his leopards suffering from heat apoplexy, but the polar bears were enjoying the sun

twice seen the sloth-bear attack a howdah-elephant. Lord Edward St. Maur, son of the Duke of Somerset, was killed by one. Mr. Sanderson, the head of the Government Elephant-catching Department, used to hunt bears in the jungle with bull-terriers. Against these the bear was unable to make a good fight. They seized it by the nose; and as its claws were not sharp like those of the leopard, the bear could not get them off.

This bear seldom produces more than two or three young at a birth. The young cub is very ugly, but very strong, especially in the claws and legs. A six weeks' old cub has been turned upside-down in a basket, which was shaken violently, without dislodging the little animal clinging inside.

THE ISABELLINE BEAR AND HIMALAYAN BLACK BEAR.

The former animal is a medium-sized variety of the brown bear. The coat in winter is of a beautiful silver-tipped cinnamon colour. The HIMALAYAN BLACK BEAR has a half-moon of white on its throat. The habits of both do not differ markedly from those of the brown bear of Europe.

Recently black bears have been most troublesome in Kashmir, attacking and killing and wounding the wood-cutters with no provocation. Dr. E. T. Vere, writing from Srinagar, says: "Every year we have about half a dozen patients who have been mauled by bears. Most of our people who are hurt are villagers or shepherds. Bears have been so shot at in Kashmir that, although not naturally very fierce, they have become truculent. When they attack men, they usually sit up and knock the victim over with a paw. They then make one or two bites at the arm or leg, and often finish up with a snap at the head. This is the most dangerous part of the attack. One of our fatal cases this year was a boy, the vault of whose skull was torn off and lacerated. Another man received a compound fracture of the cranium. A third had the bones

to illustrate a theory of his, that the killing of wild animals by other animals is not a painful one.

Rustem Pasha, once Turkish Ambassador in England, had an accident when brown bear shooting in Russia, and writes of it in the same sense: "When I met the accident alluded to, the bear injured both my hands, but did not tear off part of the arm or shoulder. In the moment of desperate struggle, the intense excitement and anger did, in fact, render me insensible to the feeling of actual pain as the bear gnawed my left hand, which was badly torn and perforated with holes, most of the bones being broken."

There is good reason to believe that when large carnivora, or beasts large in proportion to the size of their victims, strike and kill them with a great previous shock, the sense of pain is deadened. Not so if the person or animal is seized quietly. Then the pain is intense, though sometimes only momentary. A tigress seized Mr. J. Hansard, a forest officer in Ceylon, by the neck. In describing his sensations afterwards, he said: "The agony I felt was something frightful. My whole skull seemed as if it were being crushed to atoms in the jaws of the great brute. I certainly felt the most awful pain as she was biting my neck; but not afterwards, if I can remember." Sir Samuel Baker says he has



Photo by Fratelli Alinari]

[Florence

TWO POLAR BEARS AND A BROWN BEAR

Although this is a photograph from life, it is scarcely a very natural scene; as a matter of fact, all three animals belong to Herr Carl Hagenbeck's remarkable menagerie



Photo by J. H. McMillan

[Highbury]

POLAR BEAR

This bear is the most formidable of all aquatic mammals. It is almost as much at home in the water as a seal.

it into small pieces, sticks them on the back of his paw, and licks the mess until the paw is covered with sticky syrup, which he eats with great gusto. This bear is found in the Malay Peninsula, Borneo, Sumatra, and Java. It is only 4 feet high, or sometimes half a foot taller. It is more in the habit of walking upright than any other species.

THE POLAR BEAR.

ICE-BEAR is the better name for this, the most interesting in its habits of all the bears. It is an inhabitant of the lands of polar darkness and intense cold, and one of the very few land animals which never try to avoid the terrible ordeal of the long Arctic night, which rolls on from month to month. It can swim and dive nearly as well as a seal, climbs the icebergs, and goes voyages on the drifting ice, floating hundreds of miles on the polar currents, and feeding on the seals which surround it. Of the limits of size of the ice-bear it is impossible to speak with certainty. From the skins brought to this country the size of some of them must be enormous. One which lived for more than thirty years at the Zoo was of immense length and bulk. When the first discoverers went to the Arctic Seas, dressed in thick clothes and skins, the polar bears took them for seals. On Bear Island, below Spitzbergen, a Dutch sailor sat down on the snow to rest. A bear walked up behind him, and seized and crushed his head, evidently not in the least aware of what kind of animal it had got hold of. When the Jackson-Harmsworth Expedition was wintering in Franz-Josef Land, the bears were a positive nuisance. They were not afraid of man, and used to come round the huts at all hours. The men shot so many of them that they formed a valuable article of food for the dogs. The flesh is said to be unwholesome for men. The power of these bears in the water is wonderful; though so bulky, they are as light as a cork when swimming, and their strong, broad feet are first-class paddles. Whenever a dead whale is found near the shore, the polar bears assemble to feed upon it. In the various searches for the Franklin Expedition they pulled to pieces nearly all the cabins erected to hold provisions for the sledge-parties. In one case it was found that the bears had amused themselves by mounting the roof of a half-buried hut, and sliding down the snowy, frozen slope. Cubs are often brought home in whaling and sealing ships, after the mothers have been shot. There is a ready sale of them for the great menageries. Herr Hagenbeck, of Hamburg, by purchasing them quite young, has induced bears to live on good terms with tigers, boar-hounds, and leopards.

of his face smashed and lacerated. He had an axe, but said, 'When the bear sat up, my courage failed me.'

THE MALAYAN SUN-BEAR.

These small, smooth-coated bears have a yellow throat-patch like a mustard plaster, and are altogether the most amusing and comical of all the tribe. They are almost as smooth as a pointer dog, and are devoted to all sweet substances which can be a substitute for honey, their main delicacy when wild. There are always a number of these bears at the Zoo incessantly begging for food. When one gets a piece of sugar, he cracks

The manœuvres of an ice-bear in the water are marvelous to watch. Though so bulky a beast, it swims, dives, rolls over and over, catches seals or fish, or plays both on and under the water with an ease and evident enjoyment which show that it is in its favourite element. One favourite game of the ice-bear is to lie on its back in the water, and then to catch hold of its hind toes with its fore feet, when it resembles a half-rolled hedgehog of gigantic size. It then rolls over and over in the water like a revolving cask. Its footsteps are absolutely noiseless, as the claws are shorter than in the land-bear's, and more muffled in fur. This noiseless power of approach is very necessary when it has to catch such wary creatures as basking seals. A very large proportion of the food formerly eaten by ice-bears in summer was probably putrid, as they were always supplied with a quantity of the refuse carcases of whales and seals left by the whaling-ships. This may account for the bad results to the sailors who ate the bears' flesh. Now the whaling industry is so little pursued that the bears have to catch their dinners for themselves, and eat fresh food.



Photo by the New York Zoological Society

HALF-GROWN POLAR BEARS

When young polar bears are brought to England or New York on board ship, they arrive with coats almost as yellow as a sponge. It takes a week's bathing to restore the pure white colour

The Arctic explorer Nordenskiöld saw much of the ice-bears on his voyages, and left us what is perhaps the best description of their attempts to stalk men, mistaking them for other animals. "When the polar bear observes a man," he writes in his "Voyage of the Vega," "he commonly approaches him as a possible prey, with supple movements and a hundred zigzag bends, in order to conceal the direction he means to take, and to prevent the man feeling frightened. During his approach he often climbs up on to blocks of ice, or raises himself on his hind legs, in order to get a more extensive view. If he thinks he has to do with a seal, he creeps or trails himself forward on the ice, and is then said to conceal with his fore paws the only part of his body that contrasts with the snow—his large black nose. If the man keeps quite still, the bear comes in this way so near that it can be shot at the distance of two gun-lengths, or killed with a lance, which the hunter considers safer."

When a vessel lies at anchor, a polar bear sometimes swims out to it, to inspect the visiting ship; it has also a special fancy for breaking open and searching stores of provisions, boats aban-



Photo by G. W. Wilson & Co., Ltd.]

[Aberdeen]

THE ICE-BEAR'S COUCH

A favourite attitude of the polar bear is to lie stretched on its stomach, with the hind and fore legs extended flat. The head often lies between the fore paws. Notice the hair on the feet, which keeps the animal from slipping when on the ice.

with it as a cat does with a mouse. The size of these bears varies very much. Seven or eight feet from the tip of the nose to the tail is the usual length; yet they have been known to exceed even 13 feet in length. This would correspond to an immense difference in bulk and weight. An ice-bear was once found feeding on the body of a white whale, 15 feet in length, and weighing three or four tons. The whale could not have got on to the ice by itself, and it is difficult to imagine that any other creature except the bear could have dragged it there from the sea, where it was found floating. When hunting seals, polar bears will chase them in the water as an otter does a fish, but with what result is not known. Besides stalking them in the manner described above, they will mark the place at which seals are basking on the rim of an ice-floe, and then dive, and come up just at the spot where the seal would naturally drop into the water. Those shot for the sake of their skins are nearly all killed when swimming in the sea. The hunters mark a bear on an ice-floe, and approach it. The bear always tries to escape by swimming, and is pursued and shot through the head from the boat. When the females have a cub or cubs with them, they will often attack persons or boats which molest them; otherwise they do not willingly interfere with man, except, as has been said above, when they mistake men for seals or other natural prey.

The instances recorded of the affection shown by these animals for their young are somewhat pathetic. When the *Carcase* frigate, which was engaged on a voyage of Arctic discovery, was locked in the ice, a she-bear and two cubs made their way to the ship, attracted by the scent of the blubber of a walrus which the crew had killed a few days before. They ran to the fire, and pulled off some of the walrus-flesh which remained unconsumed. The crew then threw them large lumps of the flesh which were lying on the ice, which the old bear fetched away singly, and laid before her cubs as she brought it, dividing it, and giving each a share, and reserving but a small portion for herself. As she was fetching away the last piece, the sailors shot both the cubs dead, and wounded the dam. Although she could only just crawl to the place where the cubs lay, she carried the lump of flesh which she had last fetched away, and laid it before them; and when she saw that they refused to eat, laid her paws on them, and tried to raise them up, moaning pitifully. When she found she could not stir them, she went to some distance, and looked back, and then returned, pawing them all over and moaning. Finding at last that they were lifeless, she raised her head towards the ship and uttered a growl, when the sailors killed her with a volley of musket-balls.

doned and covered over, and cabins of wrecked ships. One bear which had looted a provision depôt was found to have swallowed a quantity of sticking-plaster. The ice-bear has been met swimming at a distance of eighty miles from land, and with no ice in sight. This shows how thoroughly aquatic its habits and powers are. Polar bears do not hug their victims, like the brown bear, but bite, and use their immense feet and sharp claws. It has been said that when one catches a seal on the ice it will play

CHAPTER VII.

THE SMALLER CARNIVORA.

THE RACCOON FAMILY.



Photo by Scholastic Photo. Co.]

[Parson's Green

COMMON RACCOON

This is the typical representative of the Raccoon Family. It is found in most parts of the United States, and also in South America.

the "Washer," was given to it from an odd habit these creatures have of wetting and washing their food in any water which is near. One kept at the Zoo washed her kittens so much when they were born that they all died.

The 'coon inhabits America from Canada to the south as far down as Paraguay. In size it is equal to a common fox, but is short and stout. Restless, inquisitive, and prying, it is a most mischievous beast where farmyards and poultry are within reach. It kills the fowls, eats the eggs, samples the fruit, and if caught shams dead with all the doggedness of an opossum. It is very fond of fish and shell-fish. Oysters are a special dainty, as are mussels and clams.

A LINK between the Bears and the Weasel Tribe is made by the RACCOONS and their allies. They are bear-like in having a short, thick body, and in their flat-footed manner of walking; also in their habit of sitting up on end, and using their paws as hands, to some extent, in aiding them to climb. But they are also much like the Civets; and the pretty little CACOMIXLE, or RING-TAILED CAT of Mexico, was formerly classed with the civets. They are all very active, enterprising, and quick-witted creatures of no great size, very different in temperament from the bears.

THE RACCOON.

The type of the family is the AMERICAN RACCOON itself. Its scientific name of "Loter,"



Photo by C. Reid]

[Withaw, N.B.

RACCOON

This animal has the habit of always washing its food, if possible, before it eats it

would bring its fore paws to the bars, as well as the hind pair, and in this manner would travel up and down its cage with the utmost address, every now and then thrusting out its long tongue between the wires, as if in quest of food, which, when offered to it, it would endeavour to draw in between the wires with this organ. It was very fond of being gently stroked and scratched, and when at play with any one it knew it would pretend to bite, seizing the hand or fingers with its teeth, as a dog will do when playing with its master. As the evening came on, it was full of animation, and exhibited in every movement the most surprising energy."

THE OTTERS.

As the badgers and rats seem specially adapted to an underground and cave-making existence, so the OTTERS all conform in structure to an aquatic life; yet, except the webbing of the space between the toes and the shortening and flattening of the head, there is very little obvious change in their structure to meet the very great difference in the conditions under which they live.

The SHORT-TOED OTTER is a small Indian species. It has nails on its hands in place of claws. One kept at the Zoo was a most amusing and friendly little pet, which let itself be nursed like a kitten.

The NORTH AMERICAN OTTER has the same habits as the English kind, but is somewhat larger, and has a far finer coat. It is trapped in thousands, and the fur sent over to this country to the Hudson Bay Company's and other great fur-sales. These otters, like all their family, are very fond of playing. One of their regular games is to make a snow-slide or an ice-slide down a frozen waterfall. The alighting-place from this chute is, if possible, in the water. There the trapper sets his traps, and the poor otters are caught.



By permission of Percy Leigh Pemberton, Esq.

YOUNG OTTERS

Otters, when taken young, can be trained to catch fish for their owners. In India several tribes employ them for this purpose.



Photo by Scholastic Photo Co., Parson's Green

KINKAJOU

The kinkajou eats birds and eggs as well as honey and fruit. One kept in South America killed a whole brood of turkeys, and was partial to birds' eggs.

The COMMON OTTER is far the most attractive of the British carnivora. It is still fairly common all over Britain where fish exist. It is found on the Norfolk broads and rivers, all up the Thames, in Scotland, Devonshire, Wales, Cumberland, and Northumberland. It travels considerable distances from river to river, and sometimes gets into a preserved trout-pool or breeding-pond, and does much mischief. The beautiful young otters here figured are in Mr. Percy Leigh Pemberton's collection of British mammals. Their



TWO TAME OTTERS

These two little otters were photographed by the Duchess of Bedford. Alluding to the old signs of the zodiac and their fondness for the watering-pot, their portrait was called "Aquarius" and "The Twins."

owner made a large brick tank for them, where they were allowed to catch live fish. Once one of them seized a 4-lb. pike by the tail. The pike wriggled round and seized the otter's paw, but was soon placed *hors de combat*. The largest otter which the writer has seen was bolted by a ferret from a rabbit-warren on the edge of the Norfolk fen at Hockwold, and shot by the keeper, who was rabbiting.

English dog otters sometimes weigh as much as 26 lbs. They regularly hunt down the rivers by night, returning before morning to their holt, where they sleep by day. No fish stands a chance with them. They swim after the fish in the open river, chase it under the bank, and then corner it, or seize it with a rush, just as the penguins catch gudgeon at the Zoo. Captain Salvin owned a famous tame otter which used to go for walks with him, and amuse itself by catching fish in the roadside ponds.

THE SEA-OTTER.

Common otters killed on the coast are often confounded with the SEA-OTTER. This is a great mistake. The sea-otter is as much a marine animal as the seal or the sea-lion. It swims out in the open ocean, and is even more of a pelagic creature than the seal, for it either produces its young when in the water, or at any rate carries and suckles them on the open sea. The sea-otter is much larger than the common otter. Unfortunately the fish and other marine creatures which form the food of the sea-otters are found mainly near the coast. Following them, the otters come near the Aleutian Islands, where the hunters are ever on the watch for them. If a single otter is seen, five or six boats, with a rifleman in each, at once put out, and the otter stands little chance of escape. It never was a common animal, and the prices given for the fur, up to \$1000 for a first-class skin, have caused its destruction. The skin, when stretched and cured, is sometimes 5 feet long, and is of an exquisite natural rich brown, like long plush, sprinkled all over with whitish hairs like hoarfrost.



Photo by A. S. Rudland & Son

SEA-OTTER

The sea-otter has the most valuable fur of any animal

THE SKUNKS.

Of all the strange equipments given by nature to animals for their protection that possessed by the various species of SKUNK is the most effective. These animals are able to emit a fluid so vile in odour that it seems equally hateful to all animals. Dogs, pumas, men, alike shun them, and the animals seem to know this and to presume on their immunity. An ordinary skunk is about the size of a cat, black, with bright white stripes down the sides and back. The fur is thick and handsome, and, if the animal be killed before it discharges its fluid, is not too strongly odorous to make trimmings for jackets. Mr. Hudson,

in his "Naturalist in La Plata," says: "In talking to strangers from abroad, I have never thought it necessary to speak of the dangers of sunstroke, jaguars, or the assassin's knife. But I have never omitted to warn them of the skunk, minutely describing its habits and personal appearance. I knew an Englishman who, on taking a first gallop across the Pampas, saw one, and quickly dismounting, hurled himself bodily on to it to effect its capture. Poor man! He did not know that the animal is never unwilling to be caught. Men have been blinded by them forever by a discharge of the fiery liquid in their faces. The smell pervades the whole system of any one subjected to it, like a pestilent ether, nauseating the victim till seasickness seems pleasant in comparison." Dogs can be taught to kill skunks; but they show the greatest disgust and horror when the fluid of the animal falls upon them, and sometimes roll



Photo by A. S. Rudland & Sons

A SKUNK

An American animal, noted chiefly for the scent-gland it possesses, from which it emits a most obnoxious-smelling fluid

in mud or dust in the endeavour to get rid of it.

THE BADGERS.

THE BADGERS include several genera. The SAND-BADGERS of the East have a naked snout, small ears, and rough fur, with softer fur underneath. The INDIAN BADGER is larger than that of Europe, while that of Java, Sumatra, and Borneo is smaller, and has a very short tail.

The FERRET-BADGERS from the East have elongated



Photo by C. Reid]

A BADGER IN THE WATER

[Wishaw, N.B.]

They are nocturnal animals



Photo by Scholastic Photo. Co.]

[Parson's Green

EUROPEAN BADGER

Badgers can be readily kept in confinement, and are not difficult to tame thoroughly

bodies and short tails. They are tree-climbers, and as omnivorous as the badger itself. The CAPE ZORILLA, with another species found in Egypt, is more nearly allied to the polecats, but is striped like a skunk.

The EUROPEAN BADGER is still fairly numerous. There is not a county in England where it is not found. A large colony has been established in Epping Forest, some fifty yards square of hillside being honeycombed with badger-earths. The European badger is found all over temperate Northern Europe and Asia; but being shy, wary, and mainly nocturnal, is seldom seen. At night it wanders about, and in August gets into the corn-fields, whence it is chased and caught by dogs. A Somersetshire farmer had a pointer and sheep-dog which were

adepts at this night catching of badgers. They would accompany their master along the roads, and the pointer instantly winded any badger which had crossed. Both dogs then bounded off, and soon their loud barking showed that they had found and "held up" the badger. The dogs' owner then came up, picked the badger up by its tail, and dropped it in a sack. The badger's "earth" is wonderfully deep and winding; in it the badger sleeps during the winter, and gives birth to its young, three or four of which are produced at a time. The end of March is the period of birth, but the cubs do not come out until June. In October they are full-grown. The badger carries in a great quantity of fern and grass as a bed for its cubs. Mr. Trevor-Battye writes: "I had a pair which were probably about six weeks old. They were called Gripper and Nancy. They would rest on my lap when feeding, and sit up and beg like dogs. Their hearing and power of scent were remarkable. The badgers were in a closed yard; but if any of the dogs came near, even following a path which ran at a distance of six or seven yards, they would instantly jump off my lap and disappear into a corner. The animals could walk and trot *backwards* with the greatest ease." I have never seen this noticed elsewhere, yet it is worth mentioning, because it is characteristic of the Weasel Family, not being shared, to my knowledge, by any other mammal—not, for instance, by the Bears.

Mr. A. E. Pease says of the badger: "It is easily domesticated, and if brought up by hand is found an interesting and charming companion. I had at one time two that I could do anything with, and which followed me so closely that they would bump against my boots each step I took, and come and snuggle in under my coat when I sat down."

THE RATELS.

As the mink is adapted for an aquatic diet, so the RATELS, a link between the Weasels and the Badgers, seem to have been specialised to live upon insects and honey as well as flesh. They are quaint creatures, with rounded iron-gray backs, and black bellies, noses, and feet. The African kind is found in Cape Colony and East Africa, and is believed to live largely on honey and bee-brood. The habits of the ratel are almost identical with those of the badger, except that it is less shy and very restless. A nearly similar species of ratel is found in Southern Asia from the Caspian to India.

The ratels are strictly nocturnal, and make their lair by day in hollow trees, though they are said not to climb. The skin is protected by thick, close hair, so that bees cannot sting through the fur. The skin is also very loose. If a dog bites it, the ratel can generally twist round and bite back. The African ratel is omnivorous. It eats snakes and birds. The body of a cobra has been found in the stomach of one.

THE WEASEL TRIBE.

No animals are more bloodthirsty and carnivorous than most of the Weasel Tribe. They are also well equipped both in actual weapons and in activity of body, and have powers quite out of proportion to their size. They are also gifted with magnificent coats, and constitute the most valuable source of choice furs. Sable, Marten, Mink, Wolverine, Ermine, Otters, and several others are among the most highly prized. Their claws are sharp, but not retractile. It is indeed fortunate that these creatures are so small in size, otherwise they would be among the greatest enemies of animal life. As things are, they are useful in keeping down the numbers of creatures which, like field-mice, moles, rabbits, and rats, might, and occasionally do, become a pest.

THE MARTENS.

There are two species of marten in Europe—the BEECH- and the PINE-MARTEN. The latter has a yellow throat, the former a white one. The fur is almost as fine as sable. All so-called Canadian sables are really martens. These animals are found throughout Northern Europe and Northern Asia, in Japan, and all over Northern America. In Scotland the pine-marten survives in the pine forests; also in Ireland, where it is occasionally killed on the Wicklow Mountains, near Dublin, and on the Mourne Mountains. It is believed to remain in Cumberland, Devonshire, and possibly in parts of Wales. It is a tree-loving animal, and feeds mainly on squirrels, which it pursues through the branches. It is also fond of fruit. Mr. Charles St. John discovered this in a curious way. He noticed that his raspberries were being stolen, so set a trap among the canes. Next day all he could see was a heap of newly gathered raspberry leaves where the trap was. Stooping down to move them, a marten sprang up and tried to defend itself. The poor beast had come to gather more raspberries, and had been caught. Unable to escape, it gathered the leaves near and concealed itself.

THE SABLE.

This is so little different from the marten that some have thought it only a northern variety. That is not the case, as both are found in the same area, and no one who knows anything of form and colour could mistake the true sable's fur. This fur is so fine and even that each single hair tapers gradually to a point: that is why sable brushes for painting are so valuable; they always form a point when wet. The price of these brushes, which are of genuine sable fur, though made up from fragments of the worst coloured or damaged skins, varies yearly with the price of sable in the market.



Photo by A. S. Rudland & Sons

RATEL

Ratels are curiously restless little animals, with a peculiar trot-like walk

THE MINK.

Ladies are very familiar with the fur of the MINK, which is one of the best of the less expensive varieties; it is not glossy as marten or sable, and of a lighter and more uniform brown. The mink is a water-haunting polecat, found in Siberia, North America, and Japan. Its main home is in North America, where the immense system of lakes and rivers gives scope for its aquatic habits. The under-fur is particularly warm and thick, to keep out the cold of the water, in which the animal spends more time than on land. It is not stated to catch fish, as does the otter, in the water; but it lives on frogs, crayfish, mussels, and dead or stranded fish. Minks have been kept in confinement and regularly bred in "minkeries," as is the blue fox, and in Manchuria the chow dog, for the sake of its fur.

THE POLECAT.

This is now probably the rarest of the British weasels. It is almost identically the same as the polecat-ferret, a cross-breed between it and the domesticated variety. It survives in a few of the great woodlands of the Midlands and of Oxfordshire, in Scotland, and Wales. It is found in Cumberland, near Bowness, and on Exmoor and Dartmoor where rabbits abound. It is an expert swimmer. Its habits are the same as those of the stoat, but it is slower in its movements. It catches fish, and can pick up food from the bottom of the water. Wild ones can be trained to work like ferrets. "They do not delay in the hole, but follow the rat out and catch it in a couple of bounds" (Trevor-Battye). The FERRET is a domesticated breed of polecat. It is identical in shape and habits, but unable to stand the cold of our climate in the open.



By permission of Percy Leigh Pemberton, Esq.

PINE-MARTEN

Pine-martens have most beautiful fur, and for that reason are much hunted in America



By permission of Percy Leigh Pemberton, Esq.

POLECAT

such large birds as grouse without fear or hesitation. During a great plague of field-voles in the Lowlands of Scotland in the years 1890 and 1891 the weasels increased enormously. A shepherd took the trouble to follow a weasel down a hollow drain in the vole-infested hillside; he found the bodies of no less than thirteen field-mice, which the weasel had amused itself by killing. In winter weasels hunt the corn-stacks for mice, and often make a home among the sheaves. One was seen chasing a vole by Mr. Trevor-Battye, who picked up the vole, which the weasel was just about to jump up for, when he threw it into the hedge. There the weasel pounced on it and carried it off!

The main food of the weasel is the field-mouse and small voles. Weasels are very devoted to their young; they will pick them up and carry them off as a cat does a kitten, if the nest is in danger. Their hunting shows great marks of cunning. One was seen in a field in which a number of corn-buntings were flying about, alighting on thistles. The weasel went and hid under one of the tallest thistles, on which a bunting soon alighted; an instant after it sprang up and caught and killed the bird.

THE STOAT, OR ERMINE.

This is the commonest and most widely distributed of all the Weasel Tribe. In winter the fur turns to pure white in the northern countries, and occasionally in Southern England. It is then known as the ERMINE, and yields the ermine fur. In every country where it is found it is the deadly foe of all small animals, from the hare to the smallest field-mice.

THE WEASEL.

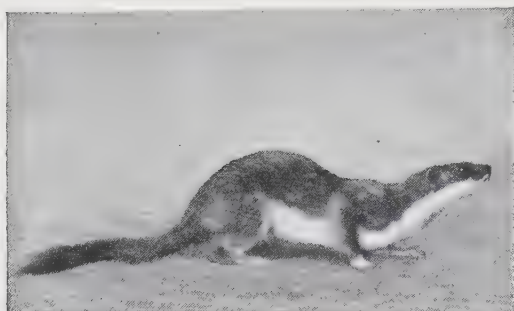
The smallest, fiercest, and commonest of its race, the little WEASEL is by no means the least formidable to other animals of the carnivora of our country. It is cinnamon-coloured, with a white throat and belly, and climbs as neatly as a cat, running up vertical boughs with almost greater facility. A weasel in a high hedge will run the whole length of the fence, from twig to twig, without descending; it threads the galleries of the field-mice, sucks the eggs of small birds in their nests, and attacks rats, mice, rabbits, and even



Photo by A. S. Rudland & Sons

HIMALAYAN WEASEL

They are fierce, and absolutely fearless when in pursuit of game



Photos by A. S. Rudland & Sons



COMMON STOAT

*In summer coat**In winter coat*

These photographs show the stoat (or ermine, as it is often called) in its summer and winter coats. This animal gives us the well-known ermine fur

It has the same passion for killing for killing's sake shared by the ferret. If a stoat finds a rabbit's nest, for instance, it always murders all the young ones. These creatures sometimes contrive to hunt in packs, or to migrate in society. They are very fond of their young, which they lay up in old crows' nests, holes in banks, or straw-stacks. They have often been seen to carry them out of danger in their mouths. The length of the head and body is $10\frac{3}{4}$ inches, and of the tail $6\frac{1}{2}$ inches. The young are usually from five to eight in number, and are born in April or May. They soon move into the long standing-grass, and remain there till it is cut. After that they move to the woods and covers, and great numbers are trapped. If not, they attack the young pheasants, and do great damage. They can climb well, and are known, as is the polecat, to ascend trees and kill birds on their nests. They also suck eggs. Forty-two pheasants' eggs were taken by Mr. de Winton from one stoat's hole.

THE GLUTTON, OR WOLVERINE.

This largest and most destructive of all the Weasel Tribe is found all round the northern edge of the Arctic Circle, from Norway to Hudson Bay. It is a large heavy animal, with a short head, sharp claws, long thick fur, and a clumsy gait. Its tusks are very long and sharp; and its appetite, if not so insatiable as the old travelers were told, is sharp enough to keep it always

hunting. It follows the fur-trappers in the woods, and, being very cunning, breaks in at the back of their fall-traps, and robs the baits or the prey caught. When Lord Milton and Dr. Cheadle made the Northwest Passage by land, they lost nearly all their furs in this way. Once, having trapped a valuable silver fox, the only one caught by them, they found nothing but shreds of fur left by the glutton. As the marten-hunters' line of traps is perhaps fifty or sixty miles long, the loss and damage caused by the glutton is most mortifying. This animal can only be caught in steel traps, and that with great difficulty.

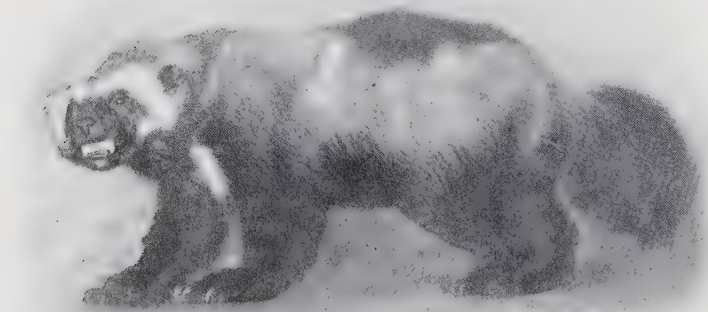


Photo by A. S. Rudland & Sons

GLUTTON

A cunning, destructive animal, which follows the trappers and robs them of the animals taken in the traps



By permission of the New York Zoological Society

CALIFORNIAN SEA-LIONS, OR EARED SEALS

Seal-herds form "rookeries" when on land at the breeding-season, during which time they undergo a complete fast

CHAPTER VIII.

MARINE CARNIVORA: THE SEALS, SEA-LION, AND WALRUS.



Photo by G. W. Wilson & Co., Ltd.,

[Aberdeen]

STELLER'S SEA-LION

The eared seal, or sea-lion, has the hind flippers divided, and is thus able to move with comparative ease on land

THERE are three families of the Sea Carnivora,—the Fur-seals, or Eared Seals; the Walrus; and the True or Earless Seals.

The first group, which are called EARED SEALS, and occasionally SEA-LIONS and SEA-BEARS, have a small outer ear, and when on land the hind flippers are folded forwards beneath the body. There is a distinct neck, and on the flippers are rudimentary claws. Some of the eared seals have the close and fine under-fur which makes their capture so remunerative. Under the skin there is often a thick layer of blubber,

which is also turned to commercial uses by the sealers.

The WALRUS stands by itself. It is a purely Arctic species, whereas fur-seals are found from Bering Sea to the Antarctic; and forms in some degree a connecting link between the eared seals and the true seals. Like the former, it turns the front flippers forwards and inwards when on land; but it resembles the true seals in having no external ears. The upper canine teeth are developed into enormous tusks of hard ivory.

The COMMON SEALS are the most thoroughly aquatic. The hind flippers seem almost to have coalesced with the tail, and are always directed backwards in line with it. They have no under-fur. On land they can only use the front flippers to aid their progress.

Most seals are marine, though some are found in the land-locked sea of Lake Baikal, in Central Asia, and the true seals often come up rivers.

THE EARED SEALS, OR SEA-LIONS.

These and the walrus have their hind limbs so far free that they can crawl on land and use their flippers for other purposes than swimming; they can comb their hair with them, and walk in an awkward way. They are divided into the fur-seals and hair-seals in the language of trade. The fur-seals are those from which ladies' sealskin jackets are made; the hair-seals are sought for their hides and oil. A demand has sprung up for the latter to make coats for automobilists to wear when riding at high speed in cold weather. The "porpoise-hide" boots are really made from the skin of the hair-seal.

Both hair-seals and fur-seals have in common the remarkable habit of assembling in large

herds during the breeding-season, and of spending a long period on land after the young are born. The male seals reach the islands, or "rookeries," first, followed by the females. The latter give birth to their young almost as soon as they reach the rocks, and are then seized and gathered into harems by the strongest and oldest males. The sea-lions of Patagonia, equally with the fur-seals of Bering Sea and the Pribyloff Islands, never feed during the whole time which they spend on the rocks, often for a period of two months.

THE FUR-SEALS.

The NORTHERN FUR-SEAL is the only member of this group surviving in any number. These animals still annually resort to the Aleutian Islands, in the territory of Alaska, in great herds to produce their young, and to certain other islets off the coast of Japan. This northern fur-seal, from the fur of which the sealskin jackets are obtained, is, when full grown, between 6 and 7 feet long. The females are only 4 feet or $4\frac{1}{2}$ feet in length. The shoulder of the male is gray, the rest of the body varying between reddish gray and deep black. The female is lighter in colour. Males of this species are not full grown till six years of age, but breed when four years old. The females produce young at three years of age. The male seals take possession of the females almost immediately after reaching the breeding grounds, each male collecting as many females as it can round it. The pups keep with their mothers. This assemblage is surrounded by great numbers of young male or bachelor seals, which the old males prevent from annexing any of the females. The greatest of all these gathering-places are on the Pribyloff Islands and certain other islets in Bering Sea. By the end of May both male and female seals swim in flocks through Bering Straits, making for the islands. The islands themselves are leased to American merchants. But as those seals killed on the way are all just about to bring forth young, the waste and cruelty of this "pelagic sealing" will be easily understood. On the islands, or "rookeries," the males, mothers, and pups remain till August, when the pups take to the water. The male seals have remained for at least two months, incessantly fighting and watching, without taking any food. By that time they are quite exhausted, the fat which they laid up previously being all absorbed. The fur has not naturally either the colour or texture



Photo by G. W. Wilson & Co., Ltd.]

[Aberdeen

SEA-LION

This photograph shows the dry mane of the sea-lion, a rather uncommon sight, as it rarely remains long enough out of the water for its fur to become absolutely dry



Resting on a Pacific Beach. (New York)

SEA LION

All sea-lions are pinnipeds. The males guard their harems with jealousy, and fight desperately with one another.

which art gives it. The outer fur is long and coarse, and only the inner fur of the exquisite texture of the "made" skin. The former is removed, and the latter dyed to the rich brown colour which we see. The fur-seals are steadily diminishing, and each year's catch is smaller than that of the year before.

The CAPE FUR-SEAL, SOUTHERN FUR-SEAL, and NEW ZEALAND FUR-SEAL are practically extinct for commercial purposes.

THE HAIR-SEALS.

Among these are the large so-called "sea-lions" of Patagonia and the North Pacific. We are familiar with their appearance, because for many years specimens have been kept at the Zoological Gardens. Their habits are much the same as those of the fur-seals. The principal species are, in the north, STELLER'S SEA-LION, and the PATAGONIAN SEA-LION in the south. Those kept at the Zoological Gardens are usually of the latter species.

STELLER'S SEA-LION is already on the road to extinction. When the annual catch of fur-seals reached 100,000 a year, the total number of these northern sea-lions was estimated at between 30,000 and 40,000. They repair every year to the Pribyloff Islands to breed, as the fur-seals do, but are shier and more entirely aquatic. The fur of the old males is tawny, and makes a kind of mane over the shoulders, whence its name. Off San Francisco there is a small

rocky island, one of the ancient "rookeries" of these sea-lions, where they are carefully preserved by the United States Government as one of the sights of the bay. Another favourite haunt in old days was on the Farralone Islands, thirty miles from the bay.

Southwards, towards the Antarctic, on the desolate and uninhabited coasts and islets of the Far Southern Ocean, the most characteristic of the fauna still remaining are the sea-lions. Formerly they swarmed in great packs, crowding at the breeding-season the seaweed-covered rocks with their huge and unwieldy forms, and at other times cruising in uncouth and noisy companies in search of the fishes and squids, which they pursued like packs of ocean-wolves. In spring the sea-lions used to struggle on to the flat shore, where the equally aquatic tribes of penguins, which had lost the use of their wings, covered acre after acre of rock with their eggs and young. These the sea-lions devoured. When the men of the first exploring-ships visited the penguins' nurseries, all the ungainly birds began to hop inland, evidently taking the men for seals, and thinking it best to draw them as far from their native element as possible. But the eared seals can make good progress of a kind on land. When Captain Musgrave and his crew were cast away for twenty months on the Auckland Islands, they found their tracks on the top of a hill four miles from the water. Captain Musgrave also saw the mother seals teaching their puppies to swim; they were by no means inclined to do this, and were afraid of the water—fairly clear presumptive evidence that seals have only recently, so far as natural time is counted, taken to the aquatic life, and modified their form so profoundly as they have.

The PATAGONIAN SEA-LION is perhaps the most numerous species, though its numbers have

been greatly reduced by whalers in search of skins and oil. The first sea-lion ever brought here was one of these. The Zoological Society did not import it; they found it in the possession of a Frenchman called Lecomte, who had taken it on the Patagonian coast, trained it, and brought it home, where he showed it in a caravan. Its training was long and difficult; it bit like a bull-dog, and Lecomte's limbs were scarred all over with its bites. In spite of this it was the cleverest performing animal ever seen up to that time in England. This sea-lion died from swallowing a fish-hook concealed in some fish with which it was fed. Lecomte was then sent out by the Zoological Society to obtain some more. With the greatest difficulty several were secured, but all died on the voyage to New York. Lecomte returned and obtained others, one of which he succeeded in bringing here. The cleverness of these animals—or rather their power of understanding what they are required to do, and their willingness to do it—probably exceeds that of any other animal, except the elephant and the dog. Why this is so is not easy to conjecture, except that the brain is more developed. They have been taught to fetch and carry on dry land like a retriever, in addition to the well-known tricks exhibited by those at the Zoo. One belonging to Barnum's Show caught strawberry-punnets on its nose when they were thrown to it, and waved a torch, which it held in its teeth and caught after tossing it into the air.

The sea-lions are much more powerful animals than the fur-seals. The male of Steller's sea-lion attains a length of 10 feet and a weight of 1,000 lbs. The AUSTRALIAN SEA-LION is even larger than that of the North Pacific. Some specimens are said to attain 12 feet in length. Captain Cook mentions seeing male Patagonian sea-lions 14 feet long and from 8 to 10 feet in circumference. Though none are now seen of such dimensions, skulls found on the beach show that anciently some of the sea-lions were larger than any now known.

It should be noted that all these creatures are carnivorous, yet the supply of food for them never seems to fail, as undoubtedly it would were the animals dependent for their food on land.



By permission of Herr Carl Hagenbeck

[Hamburg]

FEMALE WALRUS

This is a photograph of the only walrus which has ever been tamed and taught to perform tricks. It was taken when she was two years old and weighed 380 lbs. At that time she consumed 70 lbs. of boneless fish a day; a year later not less than 100 lbs. satisfied her. She is now an inmate of the Roumanian Zoological Gardens



By permission of the Hon. Walter Rothschild

[Tring

MALE WALRUS

The "tusks" of the walrus are put to many practical uses during life, and after death are much valued for the ivory

to the Arctic Seas; but Captain Cook gave a very different account of his impressions of the walruses which he saw on the north coast of America: "They lie in herds of many hundreds on the ice, huddling over one another like swine. (They lie just like a lot of pigs in a yard.) They roar and bray so very loud, that in the night, or in foggy weather, they gave us notice of the vicinity of the ice before we could see it. We never found the whole herd asleep, some being always on the watch. These, on the approach of the boat, would awaken those next to them; and the alarm being thus gradually communicated, the whole herd would awake presently. But they were seldom in a hurry to get away, till after they had been once fired at; they then would tumble over one another into the sea in the utmost confusion. They did not appear to us to be that dangerous animal which authors have described, not even when attacked. Vast numbers of them would follow us, and come close up to the boats; but the flash of the musket in the pan, or the bare pointing of it, would send them down in an instant. The female will defend her young to the last, and at the expense of her own life, whether in the water or upon the ice; nor will the young one quit the dam, though she be dead; so that if one be killed the other is certain prey." The long pendent tusks, bristly whiskers, small bloodshot eyes, and great size lent colour to the terrifying tales of the walrus. But more ancient voyagers than Captain Cook told the truth—that the "morses," as they called them, were harmless creatures, which often followed the ships from sheer curiosity. They sleep on the ice like elephantine pigs, and dive and rout on the sea-bottom for clams, cuttle-fish, and seaweeds. Probably the long tusks are used to rake up mussels and clams; they also help the walrus to climb on to the ice. A young walrus was kept for some time by the members of the Jackson-Harmsworth Expedition, and was found to be an amusing pet. One kept on board a Dundee whaler used to sleep with an Eskimo dog, and got into the same kennel with it. It ate blubber and salt pork, but liked the sailors' pea soup better than anything else; it was most sociable, and could not bear to be alone—would tumble down the hatchway to seek the society of its beloved sailors, and scramble into the cabin if the door were open. When it fell ill and before it died, it seemed most grateful for any attention shown to it. The parent walrus shows the greatest courage in trying to defend the young one. Walruses are now scarce; but as the ivory is the only part of them of much present value, there is a chance that they may not be killed off entirely.

THE TRUE SEALS.

The TRUE SEALS, with their greatly modified forms, heads set almost on to their shoulders, with no neck visible, have well-developed claws on all the toes, and in the typical species have double-rooted and small cheek teeth. The number of the incisors is variable. The GRAY SEAL of the North Atlantic is a large species which visits the North British coasts and the Hebrides.

THE WALRUS.

The distinguishing features of the walrus have been mentioned in the introductory remarks to this chapter. It should be added that it has an external ear-passage, though no external ears, and very thick and bristly whiskers. It is practically confined to the Arctic Circle, though once its range extended to the British coasts (where its bones are found in the Suffolk Crag) and to Virginia. The skull of one was found in the peat at Ely—evidence that it once ascended rivers.

The walrus stands alone; it is a real monster of the deep. Strange and awful stories were told of it by some of the early voyagers

One old male shot off the coast of Connemara weighed nearly 400 lbs., and was 8 feet long. It is found off Scandinavia and eastwards to the coast of Greenland, and breeds off our coasts in October and November. This is the large seal occasionally shot up Scotch lochs. Its colour is yellowish gray, varied with blots and patches of dirty black and brown.

THE COMMON SEAL.

This seal is smaller than the preceding. It breeds on parts of the Welsh and Cornish coasts, and is found on both sides of the Atlantic and in the North Pacific. It assembles in small herds, and frequents lochs, estuaries, and river mouths. In the summer it is fond of following flounders and sea-trout up rivers. A few years ago one came up the Thames and was shot at Richmond. The young are born in June, and are grayish white. The adults are variously mottled with gray, brown, and black. The fondness of seals for music is proverbial. Macgillivray, the Scotch naturalist, said that in the Hebrides he could bring half a score of them within forty yards of him by a few notes on his flute, when they would swim about with their heads above water like so many black dogs. A seal was captured by the servants of a landowner near Clew Bay, on the west coast of Ireland, and kept tame for four years. It became so attached to the house that, after being carried out to sea three times, it returned on each occasion. The cruel wretches who owned it then blinded it, out of curiosity to see whether it could find its way back sightless. The poor animal did so after eight days.

The common seal is still fairly numerous on the rocky western coasts of the British Islands, though a few old seals, unable to forget their early habits, appear now and then in Morecambe Bay and in the Solway. It is not uncommon off the coasts of Caithness and Sutherland. It also frequents a sand-bank in the Dornoch Firth, though it has been much persecuted there. The common seal is gregarious, while the gray seal usually lives only in pairs, or at most in small companies. Two or three dozen like to lie closely packed on shore with all their heads turning seawards. The white hair of the young seals—which, as already said, are born in June—is shed in a day or two, when the young take to the water. With regard to their reputed musical proclivities, some experiments made at the Zoological Gardens did not bear out this belief; but there is much evidence that in a state of nature they will approach and listen to music. The common seal has a large brain capacity, and is a very intelligent creature. The upper parts of this seal are yellowish gray, spotted with black and brown, the under parts being silver-gray.

The HARP-SEAL is an Arctic or ice-seal which sometimes finds its way here. The young are born



By permission of Herr Carl Hagenbeck

(Hamburg)

WALRUS AND SEA-LION

Another photograph of the walrus tamed by Herr Carl Hagenbeck. Notice the sea-lion in the right-hand corner, which also formed one of the same performing troupe



Photo by York and Son]

[Notting Hill

GRAY SEAL

Seals are not so well adapted as sea-lions for getting about on the dry land, and, except for their habit of coming ashore to bask in the sun, are thoroughly aquatic

Eskimo, and its skin the clothing of the Greenlanders. The seals make breathing-holes in the ice. There the Eskimo waits with uplifted spear for hours at a time, until the seal comes up to breathe, when it is harpooned. The BLADDER-NOSED SEAL is a large spotted variety, with a curious bladder-like crest on the head and nose of the male. Unlike all other seals, it sometimes resists the hunters and attacks the Eskimo in their kayaks.

If any evidence were needed of the great destruction which the sealing and whaling industry causes, and has caused, among the large marine animals, the case of the ELEPHANT-SEALS ought to carry conviction. These are very large seals, the male of which has a projecting nose like a proboscis. They were formerly found both north and south of the Equator, their main haunts being on the coast of California, and on the islands of the South Pacific and Antarctic Ocean. They are gigantic compared with the common seals, some of the males being from 16 to 20 feet long. Cuttle-fish and seaweed are the principal food of this seal, which was formerly seen in astonishing numbers. The whaling-ships which hunted both these seals and sperm-whales at the same time almost destroyed those which bred on the more accessible coasts, just as the earlier whalers entirely destroyed Steller's sea-cow, and their modern descendants destroyed the southern right-whales. The elephant-seal is now very scarce, and when one is killed the skin is regarded as something of a curiosity.

In the records of the voyage of the *Challenger* it is stated that there were still great numbers of the elephant-seals surviving near Heard Island, and not a few round the shores of Kerguelen Island. Professor Moseley states that on the windward shore of Heard Island "there is an extensive beach, called Long Beach. This was covered with thousands of sea-elephants in the breeding-season; but it is only accessible by land, and then only by crossing two glaciers. No boat can safely land on this shore; consequently men are stationed on the beach, and live there in huts. Their duty is constantly to drive the sea-elephants from this beach into the sea, which they do with whips made out of the hides of the seals themselves. The beasts thus ousted swim off, and often 'haul up,' as the term is, upon the accessible beach beyond. In very stormy weather, when they are driven into the sea, they are forced to betake themselves to the sheltered side of the island. Two or three old males, which are called 'beach-masters,' hold a beach for themselves and cover it with cows, but allow no other males to haul up. They fight furiously, and one man told me that he had seen an old male take a young one up in his teeth and throw him over, lifting him in the air. The males show fight when whipped, and are with

on ice-floes. It is found in great herds in Davis Straits, on the coasts of Greenland and in the greater part of the frozen Arctic Ocean. It is the animal which the sealing-vessels which hunt seals for oil and "hair"—that is, the leather of the skins, not the fur—seek and destroy. In the old days they could be seen in tens of thousands blackening square miles of ice. They are still so numerous that in Danish Greenland more than 30,000 are taken each year. The RINGED SEAL is a small variety, not more than 3 or 4 feet in length, found in great numbers in the Far North. Its flesh is the main food of the



Photo by J. W. McLellan]

[Highbury

GREY SEAL

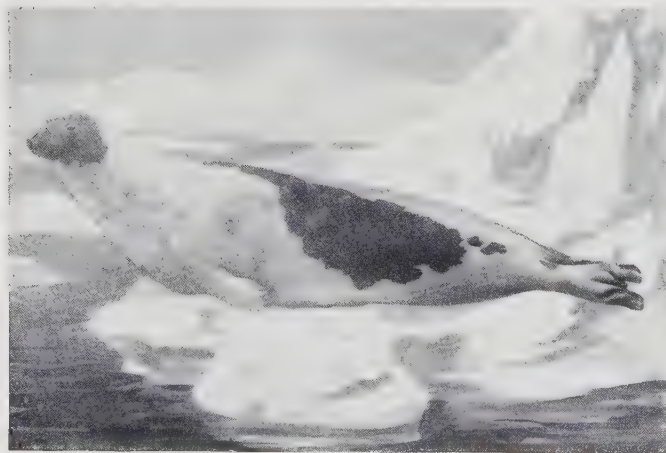
Note the difference between the seal's and the sea-lion's hind flippers. When on land, the seal advances by a jumping movement, produced by the muscles of the body, assisted forward by the front flippers

great difficulty driven into the sea. The females give birth to their young soon after their arrival. The new-born young ones are almost black, unlike the adults, which are of a light slate-brown. They are suckled by the female for some time, and then left to themselves, lying on the beach, where they seem to grow fat without further feeding. They are always allowed by the sealers to lie like this, 'in order to make more oil.' This account was corroborated by all the sealers I met, but I do not understand it. Probably the cows visit their offspring unobserved from time to time. Péron says that both parent elephant-seals stay with the young without taking any food at all till the latter are about six or seven weeks old, and that the old ones conduct the young to the water and carefully keep them company. The rapid increase in weight is in accordance with Péron's account. Goodridge gives a somewhat different story—namely, that after the females leave the young the old males and the pups proceed inland, as far as two miles sometimes, and stop without food for more than a month, during which time they lose fat. The male sea-elephants come ashore for the purpose of breeding about the middle of August, the females a little later."

Formerly the elephant-seals were found as far north as the Californian coast, where their capture was the main business of the sealing-traders. This species also formed the mainstay of the far southern sealers. As the elephant-seals were killed off, so the business became less and less profitable. It is to be hoped that the voyages of exploration to the Antarctic ice-fringe will not lead to the discovery of fresh sealing-grounds, for if this is the case there is little chance that any of the southern seals will escape entire destruction. Some form of close time has already been enforced in the pursuit of the hair-seals of Northern Europe; but it is very desirable that the species still found on our own coasts should also receive protection. Except when they paid visits to the fixed salmon-nets, they never did any harm; and fixed nets are now illegal. When a seal learned the use of the stake-nets, which these animals were very quick to understand, it would wait quietly till it saw a fish caught, and then swim up and carry it off before the fishermen could take it.

Two species—namely, the COMMON SEAL and GRAY SEAL—still regularly visit our shores. The common seal breeds on our southwestern coasts, and the gray seal off the Hebrides. If the common seal were accorded a close time, its numbers would probably increase; and the spectacle of such interesting creatures visible on our coast could not fail to be of great interest. All the old legends of mermaids and wild men of the sea are based on the capture of seals. Perhaps the most ancient is one which records such a capture in the river near Orford Castle, in Suffolk, in the reign of Henry II. The ignorant soldiers were persuaded that it was a man, and tortured it

to make it speak. They then took it to the church, and showed it the sacred emblems. As it "showed no reverence," they took it back to the castle, and fed it on fish. It was allowed to go into the river, but returned to its captors of its own accord. Later it swam away to the sea. The monk who recorded the story stated his conviction that this seal was an evil spirit which had got into the body of a drowned sailor. A gray seal was taken not many years ago in the creek leading up to the little town of Wells, in Norfolk. It was so tame that the fishermen caught it by throwing coats over it as it lay on the mud.



By permission of the Hon. Walter Rothschild

[Tring

HARP-SEAL

The harp-seal comes from Greenland



By permission of the Hon. Walter Rothschild]

[Tring

SEA-ELEPHANT

These enormous seals (about 20 feet in length) are becoming very scarce. When they come ashore, they are easily approached, though not so easily killed. They are much valued for their oil. Note the trunk-like prolongation of the nose, which, when the animal is excited, becomes distended

CHAPTER IX.

THE RODENTS, OR GNAWING ANIMALS.



Photo by W. P. Dando]

CAPYBARA

This, the largest of the rodents, is found by the rivers of South America

and rabbits are constant sources of loss to agriculture in their seasons of extraordinary increase. Most rodents feed on vegetables, though rats and mice have developed carnivorous tastes. No rodents have canine teeth.

THE SQUIRRELS.

Those of the order of Gnawing Animals which have only two incisors in each jaw, and no rudimentary teeth like those possessed by the hares, are called "Simple-toothed Rodents." Of these the family usually placed first in order is that of the SQUIRRELS and their allies. The True Squirrels and Marmots have five molar teeth on each side of the upper jaw.

Squirrels are found in nearly every temperate part of the globe, from Norway to Japan, and in very great numbers in India and the tropics. Everywhere they are favourites ;

THE Rodents, or Gnawing Mammals, have all the same general type of teeth, from which the order receives its distinctive name. There are a very large number of families and of genera among the rodents, more than in any other order of mammals. All the rodents possess a pair of long chisel-shaped incisor teeth in each jaw. The ends of these teeth are worn into a sharp edge which cuts like a steel tool. In most rodents these are the only teeth in that part of the jaw, a wide gap intervening between them and the other teeth. The hares, rabbits, and calling-hares have a minute pair of teeth set just behind the large pair in the upper jaw. The grinding-teeth are set far back, and are never more than six in number, these being sometimes reduced to four. Rodents generally have five toes on the fore feet ; in the hind feet there are in some cases only four, or even three. None of the species are of great size ; the largest, the CAPYBARA, a water-living animal of South America, is about the dimensions of a small pig. But the number of species of small rodents is prodigious, and their fecundity so great that they constantly increase in favourable seasons until they become a plague. Voles, lemmings, field-mice,



By permission of Professor Bumpus, New York

FLYING-SQUIRREL

One of the small species of the group

and though they do some mischief in highly cultivated countries, they are among the most harmless of creatures. Most of them live on wild nuts and the kernels of fruit; they suck eggs occasionally, and in Canada will come to the traps in extreme cold and eat the meat with which they are baited.

THE RED SQUIRREL.

This, the common squirrel here, is representative of the whole order. In old Scandinavian legends the squirrel is represented as the messenger of the gods, who carried the news of what was going on in the world to the other animals. Together with its close relations, it is the most graceful of all climbers of trees. With its long tail waving behind it, it races up or down the trunks and across the forests from branch to branch as easily as a horse gallops across a plain. It will descend the trunk head downwards as fast as it runs up. Squirrels pair for life, and are most affectionate little creatures, always playing or

doing gymnastics together. The squirrel builds a very good house, in which he is far more sensible than the monkeys and apes; it is made of leaves, moss, and sticks. The sticks come first as a platform; then this is carpeted, and a roof put on. No one who has seen common squirrels at work house-building has ever described exactly how they do it; it is the best nest made by any mammal, thoroughly well fitted together and waterproof. In this nest the young squirrels are born in the month of June; that year they keep with the parents, and do not "set up for themselves" till the next spring. The red colour is very persistent in squirrels. One Chinese variety, black and red, has even bright red teeth. In cold countries the red squirrels make stores of food, but spend much of the winter asleep.

It is a great pity that in England no one tries to tame the squirrels as they do in America; there they are the greatest ornament of the parks of cities, coming down to be fed as tamely as our sparrows. The writer has known one instance in which a lady induced wild squirrels to pay daily visits to her bedroom for food; they used to climb up the ivy and jump in at the open window. The great enemies of squirrels near houses are the cats, which kill all the young ones



Photo by A. S. Rudland & Sons

FLYING-SQUIRREL.

The large flying-squirrels are mainly nocturnal. They can leap a distance of 40 feet with the aid of the parachutes of skin stretching from the fore to the hind limbs.



Photo by W. P. Dando]

[Regent's Park

DORSAL SQUIRREL FROM CENTRAL AMERICA

A most beautiful species. The main colour is red, but the back is French gray, and the tail French gray and red mingled.

when they first come down from the trees. In a garden in the country a pair of squirrels had a family every summer for five years, but none ever survived the cats' persistent attacks. These squirrels were most amusing and improvident. They used to hide horse-chestnuts, small potatoes, kernels of stone fruit, bulbs of crocuses, and other treasures in all kinds of places, and then forget them. After deep snows they might be seen scampering about looking into every hole and crevice to see whether that happened to be the place where they had hidden something useful. Much of the store was buried among the roots of trees and bushes, and quite hidden when the snow fell.

THE GRAY SQUIRREL.

In Northern Europe, and across Northern Asia and America, a large gray squirrel is found. From its fur the "squirrel-cloaks" are made. These squirrels live mainly on the seeds of pines in winter, and on wild fruits, shoots, and berries in summer. It has been noticed that they will entirely forsake some great area of forest for a year or two, and as suddenly return to it. The marten and the sable are the great enemies of the gray squirrel, but the eagle-owl and goshawk also kill numbers of them. In many countries the flesh of the squirrel is eaten.

The gray-and-black squirrel of the United states was thus described some sixty years ago: "It rises with the sun, and continues industriously engaged in the search of food for four or five hours every morning. During the warm weather of spring it prepares its nest on the branch of a



Photo by A. S. Rudland & Sons

ASIATIC CHIPMUNKS

Small ground-squirrels which store food for the winter

tree, constructing it first of dried sticks, which it breaks off, or, if these are not at hand, of green twigs as thick as a finger, which it gnaws off from the boughs. These it lays in the fork of a tree, so as to make a framework. It lines this framework with leaves and over these again it spreads moss. In making the nest, the pair is usually engaged for several days, spending an hour in the morning hard at work. The noise they make in cutting the sticks and carrying material is heard at some distance." In winter they reside entirely in the holes of trees, where



Photo by W. P. Dando]

RED-FOOTED GROUND-SQUIRREL

This species has some of the characteristics of the tree-squirrels, among them the bushy tail

their young are in most cases born. Green corn and young wheat suffered greatly from their depredations, and a wholesale war of destruction used to be waged against them everywhere. In Pennsylvania an old law offered threepence a head from the public treasury for every squirrel destroyed, and in 1749 the enormous sum of \$40,000 was paid out of the public funds for this purpose. In those days vast migrations of these squirrels used to take place, exciting not only the wonder but the fear of the old settlers. In the Far Northwest multitudes of squirrels used to congregate in different districts, forming scattered bands, which all moved in an easterly direction, gathering into larger bodies as they went. Neither mountains nor rivers stopped them. On they came, a devouring army, laying waste the corn- and wheat-fields, until guns, cats, hawks, foxes, and owls destroyed them.

THE FLYING-SQUIRRELS.

One of the finest squirrels is the TAGUAN, a large squirrel of India, Ceylon, and the Malacca forests. It is a "flying-squirrel," with a body 2 feet long, and a bushy tail of the same length. Being nocturnal, it is not often seen; but when it leaps it unfolds a flap of skin on either side, which is stretched (like a sail) when the fore and hind limbs are extended in the act of leaping; it then forms a parachute. The colour of this squirrel is gray, brown, and pale chestnut. There are a number of different flying-squirrels in China, Formosa, and Japan, and in the forests of Central America. One small flying-squirrel, the POLATOUCHE is found in Northeast Russia and Siberia. It flies from tree to tree with immense bounds, assisted by the "floats" on its sides. Though only six inches long, it can cover distances of 30 feet and more without difficulty. Wherever there are birch forests this little squirrel is found. One nearly as small is a native of the Southern states of America, ranging as far south as Guatemala.

In Africa, south of the Sahara, the place of the Oriental flying-squirrel is taken by a separate family. They have a different arrangement of the parachute from that of the flying-squirrels of India. This wide fold of skin is supported in the Asiatic squirrels by a cartilage extending from the wrist. In the South African flying-squirrels this support springs from the elbow, not from the wrist; they have also horny plates on the under-surface

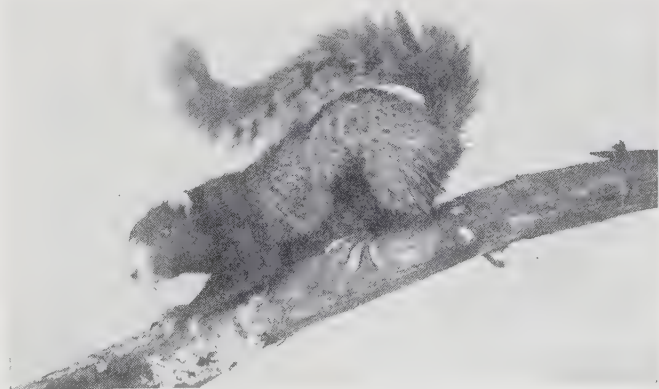


Photo by Dr. R. W. Shufeldt]

[Washington

BLACK FOX-SQUIRREL

The fur of this species is as valuable as that of the gray squirrel



Photo by Scholastic Photo. Co.]

[Parson's Green

LONG-TAILED MARMOT

The marmots live by preference on high and cold mountains just below the line of eternal snow in Europe. In Asia, where the snow-line is higher, they are found at altitudes of 12,000 feet

lower one, and then climbing up again to make a fresh start. . . . They litter about twice in a year, once in September. The young remain in the nest for about nine weeks, during which they are fed by the old ones on such food as shoots and kernels. They do not attempt to jump or 'fly' till the end of that period, extending the length of their jumps with their growth."

The ETHIOPIAN SPINY SQUIRRELS have coarse spiny fur; the little INDIAN PALM-SQUIRREL is marked with longitudinal dark and light stripes on the back; others have light bands on their flanks.

THE GROUND-SQUIRRELS.

Many tree-living squirrels pass a good deal of their time on the ground; but there are others which burrow like mice, and, though they climb admirably, prefer to make their nest, and the regular squirrel's store of nuts, in the earth, and not in the branches. The best known is the little CHIPMUNK of the United States, a favourite pet of many American children. There are many kinds of chipmunks, all of which have pouches in their cheeks for carrying food. The commonest is the STRIPED CHIPMUNK. It is from 8 to 10 inches long, with white stripes, bordered with dark brown on each side. The chipmunks' hoards of grain and nuts are so large that the Indians used to rob them in times of scarcity. There is also a ground-squirrel in Northern Europe and Northern Asia with much the same habits as the chipmunk.

The burrows of the chipmunks are deep and extensive, and into them these rodents convey such quantities of grain and maize as to inflict considerable loss on the farmer. The SIBERIAN GROUND-SQUIRREL has been known to conceal 8 lbs. weight of corn in its hole. This has a sleeping-chamber at the end, filled with moss and leaves, on which the family sleep. From this side passages are dug, all leading to chambers stocked with food, often far in excess of the wants of these provident little creatures. The surplus stores are said to be eaten in the spring by wild boars and bears.

THE PRAIRIE-DOGS AND MARMOTS.

Between squirrels which live in holes in the ground and the marmots and their relations no great gap is found. These creatures drop the climbing habit and increase that of burrowing. In disposition most of them are still very squirrel-like, though they gain something in solemnity of demeanour by never going far from their holes. A prairie-dog or marmot is like a squirrel

which has left society and settled down in a suburb. The little creatures known in America as PRAIRIE-DOGS have in Northern Europe and the steppes of Asia some first cousins, called SUSLIKS. Both live in colonies, burrow quickly and well, feed on grass, and have a habit of sitting bolt upright outside their holes, keeping a lookout for enemies. The prairie-dogs also bark like a little dog when alarmed. Before going to sleep, the latter always carry the dry grass on which they slept out of their burrow, and carefully bite up into short lengths a fresh supply to make their beds. The susliks and prairie-dogs are of a khaki colour, like the sand in which they delight to burrow. Every one has heard that the little burrowing-owls live in the same holes in company with the prairie-dogs, and that the rattlesnake sometimes eats both the young prairie-dogs and the young owls. An acquaintance of the writer who had killed a rattlesnake actually



By permission of the New York Zoological Society

PRAIRIE-DOGS, OR MARMOTS

A most characteristic picture. It shows the prairie-dogs' method of holding their food while they eat, or cutting up grass to make their beds

took a young prairie-dog from its mouth. The snake had not struck it with the poison, but had begun to swallow it uninjured. It was still alive, and recovered.

The suslik was once found in England; its remains, with those of other steppe animals, are found in the river gravels and brick earth in the London basin. The prairie-dogs form a kind of connecting-link between the susliks and the true marmots. They have short ears, short tails, rounded bodies, and possess great powers of digging. When a prairie-dog has nothing better to do, it usually spends its time either in digging holes or in cutting up grass or anything handy to make its bed with. Young prairie-dogs are not so large as a mouse when born. The adult animals feed almost entirely on grass and weeds in their wild state; they seem quite independent of water, and able to live in the driest places.

The ALPINE MARMOT is a much larger species than the prairie-dog. It lives on the Alps just below the line of perpetual snow. From five to fifteen marmots combine in colonies, dig very deep holes, and, like the prairie-dogs, carefully line them with grass; they also store up dry

grass for food. In autumn they grow very fat, and are then dug out of the burrows by the mountaineers for food. Young marmots used to be tamed and carried about by the Savoyard boys, but this practice is now rare. The monkey is probably more attractive to the public than the fat and sleepy marmot. Marmots are about the size of a rabbit, and have close iron-gray fur.

Tschudi, the naturalist of the Alps, says of the marmots that they are the only mammal which inhabits the region of the snows. No other warm-blooded quadrupeds live at such an altitude. In spring, when the lower snows melt, there are generally small pieces of short turf near their holes, as well as great rocks, precipices, and stones. Here they make their burrows, outside which they feed, with a sentinel always posted to warn them of the approach of the eagle or lammergeir. The young marmots, from four to six in number, are born in June. When they first appear at the mouth of the holes, they are bluish gray; later the fur gains a brownish tint. The burrows are usually at a height of not less than 7,000 or 8,000 feet. Winter comes on apace. By the end of autumn the ground is already covered with snow, and the marmots retire to sleep through the long winter. As they do not become torpid for some time, they require food when there is none accessible; this they store up in the form of dried grass, which they cut in August, and leave outside their burrows for a time to be turned into hay.

The ALPINE MARMOT is also found in the Carpathians and the Pyrenees. Another species, the BOBAC, ranges eastward from the German frontier across Poland, Russia, and the steppes of Asia to Kamchatka. In Ladak and Western Tibet a short-tailed species, the HIMALAYAN MARMOT, is found, sometimes living at a height of nearly 17,000 feet. The GOLDEN MARMOT is found in the Pamirs.

THE BEAVERS.

The BEAVERS are classed as the last family of the squirrel-like group of the Rodents, and the largest creatures of that order in the northern hemisphere. The value of their fur has caused their destruction in great measure where they were once numerous, and has led to their total extirpation where there is evidence that they existed as a not uncommon animal. They were formerly distributed over the greater part of Europe.



By permission of the New York Zoological Society

AMERICAN BEAVER

The engineering feats of the beavers, in damming streams and forming pools, are the most remarkable achievements performed by living animals

that they were not uncommon. In Wales beavers' skins were mentioned in the year 940 in the laws of Howel Dha, and in 1188 Giraldus stated that they were living on the river Teify, in Cardiganshire. Beavers were formerly found in France, especially on the Rhone, where a few are still said to survive, in Germany, Austria, Russia, Poland, and in Sweden and Norway, on the rivers Dwina and Petchora, and on the great rivers of Siberia. A few still remain in two districts of Norway, and some were known to frequent the Elbe in 1878. The Moldau, in Bohemia, is also credited with a colony; but parts of the Danube are believed to be the chief haunt of the European beaver at the present time. The American beaver, though its range has greatly contracted, is still sufficiently numer-



Photo by C. Reid]

BEAVER

The beaver here shown was kept as a pet. It was photographed upon a stream. The long upper fur is removed when the skin is prepared by the furrier

[Winlaw, N. B.]



Photo by C. Reid]

[Wishaw, N.B.]

BEAVER

This is a photograph of a swimming beaver. Note the advantage it has taken of the eddy in the stream

itical and zoological. The value of the fur was anciently such that, when the first French explorers began to search the Canadian lakes, and later when the Hudson Bay Company succeeded to the French dominion, the history of Canada was largely bound up with beaver-catching and the sale of the skins. In the early days of the Company the "standard of trade" of the Northwest was a beaver skin. For nearly a century the northern territories were organised, both under French and English rule, with a view to the beaver trade. The beaver was, and is, the crest of the Canadian Dominion.

The beavers' engineering feats have for their object to keep up a uniform depth of water in the streams where they live. On large rivers there is always enough water for the beaver to swim in safety from its enemies, and to cover the mouth of the hole which it makes in the bank, just as a water-rat does. But on small streams, especially in Canada, where during the winter the frost prevents the springs from running, there is always the danger that the water may fall so low that the beavers would be left in shallow water, a prey to the wolverine, wolf, lynx, or human enemies. To keep up the water, the beavers make a dyke or dam across the stream. This they go on building up and strengthening until they have ponded back a large pool. In time, as they never seem to stop adding to their dam, the pool floods the ground on either side of the stream and makes a small lake. It flows over the parts of the bank where their holes are; these also be-

ous for its fur to be a valuable item in the winter fur-sales.

The beaver's tail is flattened like a paddle and covered with scales; its hind feet are webbed between the toes; it has sharp claws, which aid it in scratching up mud, and a thick, close fur, with long brown hair above, and a most beautiful and close under-fur, which, when the long hairs have all been removed, forms the beaver fur of which hats were once made, and trimmings for ladies' jackets and men's fur coats are now manufactured. There are two separate lines of interest in connection with the animal—pol-



Photo by Dr. R. W. Shufeldt]

[Washington]

MUSK-RAT

A small water rodent, a native of our rivers. Immense numbers are killed for the sake of their fur



BEAVER.
(Castor fiber).
 $\frac{1}{2}$ Life-size.

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come filled up, because the beavers carry into them every day fresh quantities of wood-chips to make their beds. The beavers then scrape out the earth on the top, pile sticks over this, plaster the sticks with mud, and so build a dome over their bedroom. In time this is raised higher and higher, the artificial lake rises too, and the complete "beaver-lodge" surrounded with water is seen. The old trappers who found these *in situ* imagined they were built at once and outright in the water. The experiments and observations at Leonardslee, in Sussex, where Sir E. G. Loder has kept beavers in a stream for ten years, show that the "evolution" of the lodge is gradual and only incidental. But the building of the dyke, the cutting of the trees, and the making of the pool are done with a purpose and definite aim.

What this is, and how done, is explained in the following description of the beaver colony at Leonardslee: "Their first object was to form in the brook a pool, with water maintained at a constant height, to keep the mouth of their burrow in the bank submerged during the droughts of summer. To this end they build a dam, as good a specimen of their work as can be seen even in Canada. Its situation was carefully chosen. A small oak, growing on what appears to have been a projection in the bank, gives support to the work. It may be concluded that this was part of their intention; for though they have cut down every other tree in their enclosure to which they had access, except two or three very large ones, they have left this small tree which supports the dam untouched. (Later, when the dyke was stronger, they cut it down.) Above this stretches the dam, some 12 yards wide, and rising $5\frac{1}{2}$ feet from the base to the crest. The beavers build it solidly of battens of alder, willow,



Photo by W. P. Dando

GAMBIAN POUCHED RAT

These rats are able to carry food in their cheek-pouches, which are used as pockets

larch, and other straight-limbed trees, cut into lengths of from 2 to 3 feet. The bark of each was carefully gnawed off for food; and the whole work, constructed of these cut and peeled logs, has a very regular and artificial appearance. Smaller twigs and sticks are jammed in between the battens, and the interstices are stuffed with mud, which the beavers bring up from the bottom of the pool in their mouths, and push in with their feet, making the whole structure as water-tight as a wall." This dam converted what was a narrow brook into a long lake, some 50 yards by 15 or 20 yards broad. Later the beavers made another larger dam below this, cutting down some more trees. One tree gave them a great deal of trouble; it was a beech, 40 feet high, and hard to gnaw; so they waited till the water rose round it, and then *dug it up*. When the large dam was made, quite a considerable lake was formed below the first. They then neglected their first dam, and let the water run out of the top lake into the lower one. At the time of writing there are five old beavers and a family of young ones at Leonardslee. The work done by these beavers, so few in numbers, shows how large colonies may alter the course of rivers.

THE DORMICE.

There are a considerable number of animals, even here, which hibernate. Most of these feed largely on insect food, which in winter is unobtainable in any great quantity. Consequently the hedgehog and the badger, which live largely on snails and worms, go to sleep in the famine months. So does the sleepest of all—the DORMOUSE. This alone would show that this little rodent probably feeds on insects very largely, for if it only ate nuts and berries it could easily store these, and find a good supply also in the winter woods. It has been recently proved that dormice are insectivorous, and will eat aphides, weevils, and caterpillars. But a dormouse hibernates for so long a time that one might imagine its vitality entirely lost; it sleeps for six months at a time, and becomes almost as cold as a dead animal, and breathes very slowly and almost imperceptibly. Mr. Trevor-Battye says that if warmed and made to awaken suddenly in

the winter it would die in a minute or two, its heart beating very fast, "like a clock running down." Before their hibernation dormice grow very fat. There is a large species, found in Southern Europe, which the Romans used to eat when in this fat stage. In winter dormice usually seek the nest of some small bird, and use it as a sleeping-place. They pull out and renew the lining, or add a roof themselves. Into the interior they carry a fresh supply of moss, and sleep there in great comfort. Their great enemy at this time is the weasel. There are two main groups of the dormice, divided by naturalists in reference to the structure of their stomach. The South African GRAPHIURES have short tufted tails. The hibernating habit is confined to the more northern species.



Photo by A. S. Rudland & Sons

POCKET-GOPHER

The pocket gophers are almost entirely subterranean. Their burrowing powers are remarkable. Their teeth, as well as claws are used to dig them.

the Philippine form are not. The GERBILS form another group, mainly inhabitants of desert districts. They have very large eyes, soft fur, and tails of various length and form in different species. They have greatly developed hind legs, and leap like jerboas, and are found in Southern Europe, Asia, and Africa. The PHILIPPINE RATS, large and long-haired, and the TREE-MICE of Africa south of the Sahara, form other groups. A very mischievous race of rodents is represented in Europe by the HAMSTERS, and in America by a closely allied group, the WHITE-FOOTED MICE.

THE HAMSTERS.

The HAMSTER is a well-known European species, and represents the group of pouched rats.

THE MOUSE TRIBE.

This family, which includes the MICE, RATS, and VOLES, contains more than a third of the number of the whole order of Rodents. Some are arboreal, others aquatic; but most are ground-living animals and burrowers. The number of known species has been estimated at 330. Among the most marked types are the WATER-MICE of Australia and New Guinea, and of the island of Luzon in the Philippines. The feet of the Australian species are webbed, though those of



Photo by A. S. Rudland & Sons

LONG-EARED JERBOA

These curious little animals are mainly desert creatures. They move by a series of leaps

above. A yellow spot marks each cheek. The lower surface of the body, the legs, and a band on the forehead are black, and the feet white. Thus the hamster reverses the usual natural order of colour in mammals, which tends to be dark on the back and light below. The animal is 10 inches long, and very courageous. Hamsters have been known to seize a horse by the nose which stepped on their burrow, and at all times they are ready to defend their home. Besides vegetables and corn, they destroy smaller animals. They spend the winter in a more or less torpid state in their burrows, but emerge early in spring. They then make their summer burrows and produce their young, which in a fortnight after birth are able to begin to make a burrow for themselves.

Among the South American members of the group to which the hamster belongs are the FISH-EATING RATS, with webbed hind feet. The RICE-RAT, which is found from the United States to Ecuador, lives on the Texas prairies much as do the prairie-marmots, though its burrows are not so extensive, and often quite shallow. In these the rats make beds of dry grass.

THE VOLES.

The VOLES are allied to the preceding groups, but are marked externally by a shorter and heavier form than the typical rats and mice. Their ears are shorter, their noses blunter, their eyes smaller, and the tail generally shorter. They are found in great numbers at certain seasons, when

These creatures have cheek-pouches to aid them in carrying food. In addition they are most voracious and inquisitive, so that the hamster is a type throughout Central Europe of selfishness and greed. We are sorry to add that John Bull occasionally appears in German cartoons as the "Land-hamster," or land-grabber. Hamsters are numerous from the Elbe to the Obi. They burrow and make cellars in the corn- and bean-fields, and convey thither as much as a bushel of grain. As soon as the young hamsters can shift for themselves, each moves off, makes a separate burrow, and begins to hoard beans and corn. As the litter sometimes contains eighteen young, the mischief done by the hamster is great. Its coloration is peculiar. The fur, which is so thick as to be used for the linings of coats, is a light yellowish brown



Photo by A. S. Rudland & Sons

CAPE JUMPING-HARE

This animal is very common in South Africa. The Boers call it the "Springbaas"

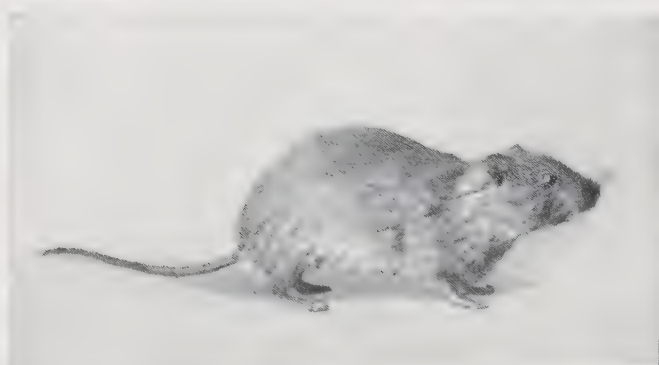


Photo by A. S. Rudland & Sons

OCTODONT

The octodont, so called because they have four molar teeth on each side of the jaw are a group of rodents found mainly in South America

BANK-VOLE is a small English species, replaced on the Continent by the **SOUTHERN FIELD-VOLE**.

The **WATER-RAT** belongs to the vole group. It is one of the most commonly seen of all American mammals—probably, except the rabbit, the most familiar. Although not entirely nocturnal, it prefers the darkness or twilight; but whenever the visitor to the waterside keeps still, the water-rats will allow him to watch them. The writer has had rather an extensive acquaintance with these cousins of the beavers, and, while watching them, has never ceased to be struck with their close resemblance to those creatures. At Holkham Lake, in Norfolk, he noticed a willow-bush, in which a number of twigs had been gnawed off; and then saw the missing sticks lying neatly peeled, just like “beaver-wood,” in the water below. Waiting quietly, he noticed a water-rat climb into the bush, gnaw off a willow twig, descend with it to the edge of the water, and there, sitting on some crossed boughs, peel and eat the bark, just as a beaver does. By rivers a sound is often heard in the round reeds as of something tearing or biting them; it is made by the water-rats getting their supper. The rat cuts off three or four sedges and makes a rough platform. It then cuts down a piece of one of the large round reeds full of pith, and, holding it in its hands, seizes the bark with its teeth, and shreds it up the stem, peeling it from end to end. This exposes the white pith, which the rat then eats. Water-rats have been seen to swim out and pick up acacia blossoms floating on the water. When swimming under water, each hair is tipped by a little bubble, which makes the rat look like quicksilver. When it comes out, the rat shakes itself with a kind of shiver, throwing all the water off its coat. Though so good a swimmer, its feet are not webbed. It is found from Scotland to the Bering Sea, but not in Ireland.

In the Far North the **LEMMING** takes the place of the voles. It is a very small, short-tailed creature, like a diminutive prairie-dog. Like the voles, lemmings have seasons of immoderate increase. They then migrate in enormous flocks, and are said never to stop till they reach the sea, into which they plunge. It is believed that they are following an inherited instinct, and that where there is now sea there once was land, over which they passed onwards.

The **MUSK-RAT** inhabits the same waters as the beaver of North America. It makes a house, generally

they often develop into a pest. The **SHORT-TAILED FIELD-VOLE** is responsible for much destruction of crops in Europe. One of the latest plagues of these animals took place in the Lowlands of Scotland, where these voles devoured all the higher pastures on the hills. Nearly at the same time a similar plague occurred in Turkish Epirus. When a special commissioner was sent to enquire into the remedies (if any existed) there in use, he found that the Turks were importing holy water from Mecca to sprinkle on the fields affected. The



Photo by L. Medland, F.Z.S.]

[North Finchley

COYPU

This is a large aquatic rodent, found on the South American rivers. Its fur, called “nutria,” forms a valuable export from Argentina

of reeds piled in a mound, in the lakes and swamps. The body is only 12 inches long, but the fur is thick and close, and much used for lining coats and cloaks. The vast chains of rivers and lakes in Canada make that country the favourite home of the musk-rat. This creature lives upon roots of aquatic plants, freshwater-mussels, and stems of juicy herbs. Besides making the domed houses of grass, reeds, and mud, it also burrows in the banks of streams. There it makes rather an elaborate home, with numerous passages leading to the water. The odour of musk is very strong even in the skin. The tail is narrow and almost naked. This species is the largest of the vole group.

THE TYPICAL RATS AND MICE.

These animals were originally an Old World group. Though the brown rat is now common in America, it is believed to have come originally from China.

A very large number of animals are now almost dependent on man and his belongings. Such creatures are said to be "commensalistic," or eaters at the same table. They are often very unwelcome guests, whether they are flies, sparrows, or cockroaches; but probably the least welcome of all are the rats and mice. The BROWN RAT is the best known of any. It has come into worse repute than usual of late, because it is now certain that it harbours the plague-bacillus, and communicates the disease to man. Its habits and appearance need no description. The BLACK RAT is the older and smaller species indigenous in Europe, which the brown rat has almost extirpated from England. A few old houses still hold the black rat, and there are always a few wild ones at the Zoological Gardens which feed in the animals' houses. The BLACK-AND-WHITE RAT (not the albino white rat) kept tame in this country is probably a domesticated form of the ALEXANDRINE RAT of Egypt.

The HOUSE-MOUSE is now found in all parts of the world to which Europeans have access. In England its main home is in the corn-ricks. Were the farmers to thresh the grain, as is done in the United States, as soon as it is cut, mice would be far less common. Besides these parasitic mice, there are a host of field- and forest-mice in this and other countries. One of the best-known English species is the HARVEST-MOUSE, which makes a globular nest of grass in the wheat-fields, attached to stems of corn or weeds. In this the young are born. In winter the mouse lives in holes in banks, and lays up a store of kernels and grain. The WOOD-MOUSE is larger than the former, or than the HOUSE-MOUSE. It is yellowish brown in colour, lays up a great store of winter food, and is itself the favourite prey of the weasel.



Photo by A. S. Rudland & Sons

SHORT-TAILED HUTIA

The hutias are another group of octodonts, found in the West India Islands



By permission of the Hon. Walter Rothschild, Tring

PORCUPINE

The common porcupine is found in North America, Italy, Spain, and North Africa

THE BANDICOOT.

A very mischievous class of rats is represented by the various species of BANDICOOT. They are found throughout Southern Asia as far as Ceylon, and in Kashmir and Turkestan. The BANDICOOT-RAT of India is a large and destructive species which is sometimes brought to the London docks in ships, but has not spread into the country.

OTHER MURINE RODENTS.

Among the numerous other rodents allied to the rat group are the MOLE-RATS, with short mole-like bodies. The largest is the GREAT MOLE-RAT, found in Southeastern Europe, Southwestern Asia, and Northeastern Africa. It is a subterranean creature, burrowing for food like a mole. The BAMBOO-RATS have minute eyes, small external ears, and a short tail partly covered with hair. In Somaliland a small, almost naked SAND-RAT is found, which burrows in the sand of the desert, throwing up little heaps like mole-hills.



Photo by A. S. Rudland & Sons

PORCUPINE

This photograph shows the arrangement of the porcupine's defense of spines; but when frightened it erects these, so as to form a complete protection to the body

THE GOPHERS.

In North and Central America the POCKET-GOPHERS form a curious group of small rodents with cheek-pouches opening on the outside. They spend their entire existence underground, and are said to use their incisor teeth as picks to open the hard earth in their tunnels. They push the loosened soil out by pressing it with their chests and fore feet. When a gopher has eaten enough to satisfy the immediate calls of hunger, it stores all spare food away in the large cheek-pouches. When gophers desire to empty the pouches, they pass their feet along their cheeks from behind, and press the food forwards on to the ground.

THE JERBOAS, SPRINGHAAS, AND JUMPING-MICE.

The hopping rodents have an immense range, from Southern Europe, through Africa, Arabia, India, and Ceylon, and even in the New World, where the AMERICAN JUMPING-MOUSE is found throughout the northern part of the continent. The latter is only 3 inches long. The true JERBOAS are mainly found in Africa. All these, when excited, move like kangaroos. Their main home is the Central Asian steppe region, but they are found in Egypt, India, Syria, and Arabia. The hind legs are much elongated, the fore legs very small, and the body usually of a sandy colour. The American jumping-mouse, though a very small creature, can cover from 3 to 5 feet at each leap. It inhabits the beech and hard-wood forests. In winter it makes a globular nest about 6 inches under the surface of the ground.



Photo by W. P. Dando

[Regent's Park]

VISCACHA

The Viscacha forms colonies like those of the prairie-dogs. It is found on the pampas south of the La Plata

The CAPE JUMPING-HARE forms a family by itself, with no near allies. It is of a tawny brown



Photo by W. P. Dando

CHINCHILLA

A small rodent of the Andes, possessing very soft and valuable gray fur

large rivers of that continent, where its fur is a valuable commodity for export. When swimming, the female coypu carries its young on its back. The coypu is usually 20 inches long, with a tail two-thirds of the length of its head and body. The general colour is brown above and brownish yellow below. Coypus live in pairs in holes in the river-banks. In the Chonos Archipelago they frequent the seashore, and burrow near the beach.

The HUTIA, another large octodont, is found in the West Indies. There are two species, both partly arboreal. The TUco-TUCOS, burrowing octodonts of the pampas and the far south of the American Continent, are rat-like animals, with large claws and very small eyes and ears.

THE PORCUPINES.

These animals are either tree-climbers or ground-dwellers. The former are found in South America, though one, the CANADIAN PORCUPINE, is found in the North; the latter are European and Asiatic. In Africa they are also common. The Canadian porcupine passes nearly all its life in trees, feeding on the leaves; but it has not a prehensile tail. The COMMON PORCUPINE is abundant in Italy (where it is eaten by man), Greece, Spain, and Africa. It lives in burrows or among rocks. In India a very similar species is found. The head and shoulders of these ground-porcupines are not protected by the larger sharp spines which guard the rest of their bodies.

The tree-porcupines of the forests of Central America have long prehensile tails, and are very lightly built. The quills are short, the head rounded, and the appearance very different from that of the European or African species. The common porcupine of Europe and North Africa measures about 28 inches in length from the nose to the root of the tail. The head, neck, and shoulders are covered with short spines and hairs, and the

colour, becoming almost pure white below. The tail is long, and carried upright as the animal leaps. The head and body are nearly 2 feet long, and the tail 20 inches. It is found both in the plains and mountains of South Africa, where it makes deep burrows, in which several families live. It is mainly nocturnal.

THE OCTODONT FAMILY.

America is the main home of this family of rodents, though there are several representatives in Africa. Their name is due to the fact that they have four molar teeth on each side of the jaw. The best-known species is the COYPU, or NUTRIA, of South America, an aquatic, fur-bearing animal. It is very plentiful in the



Photo by York & Son]

[Notting Hill]

AGUTIS

The agutis are also a South American group, found both in the forests and on the plains



Photo by A. S. Rudland & Sons

PACA, OR SPOTTED CAVY

The pacas are among the larger rodents, found mainly in the northern part of the South American region

beautiful creature of the high Andes from which chinchilla fur is taken. The COMMON CHINCHILLA is about 10 inches long, and the SHORT-TAILED CHINCHILLA rather smaller. The exquisite fur is well known. Two other chinchillas are more like hares in appearance. All four creatures are found on the Andes.

THE AGUTIS AND PACAS.

South America also produces a family of rodents not unlike small pigs, but nearer to the mouse-deer in general appearance; they are called AGUTIS. Mainly forest animals, but living also in the plains, they feed on grass, leaves, and plants of all kinds; they are very swift in their movements, and have much the habits of the small South African bucks. The fur is long, olive- or chestnut-coloured, and thick.

The PACAS are allied to the agutis, but are stouter; they live either in burrows made by themselves, or in holes in the banks of rivers, or in old tree-roots. The pacas are spotted and rather ornamentally marked; they are found from Ecuador to Brazil and Paraguay.

THE CAVIES.

The DINOMYS, a spotted rodent known by one example from Peru, has been thought to form a link between the pacas and the cavies, of which the guinea-pig is the most familiar and the aquatic capybara the largest. The original of our guinea-pig is believed to be the RESTLESS CAVY, a small rodent common on the plains of La Plata. It is dark blackish, with yellowish-gray and white hairs of the domesticated species; and it is suggested that the original of the present name was "Guiana pig." This cavy lives in thickets rather than in forests or plains.

The PATAGONIAN CAVY is a larger form, about twice the size of our hare. It burrows in the ground, and has a gray coat, with yellowish markings on the sides. It has been acclimatised successfully in France

shoulders and back by a crest of long spines, varying from 12 to 15 inches in length. The tail also carries spines

VISCACHAS AND CHINCHILLAS.

On the plains of La Plata the commonest large rodent is the VISCACHA. It assembles in societies like the prairie-dogs, but is a much larger animal, from 18 inches to 2 feet long. Viscachas always set a sentinel to give warning of danger. They cut every kind of vegetable near and drag them to their holes; they also have a habit of picking up and collecting round the burrows any object which strikes them as curious. Articles lost by travelers, even whips or boots, may generally be found there. The viscacha belongs to the chinchilla family, but differs much from the



Photo by York & Son

[Notting Hill]

PACAS, OR SPOTTED CAVIES

This photograph, which represents young animals, shows in great perfection the linear arrangement of the stripes



Photo by Scholastic Photo. Co.

PATAGONIAN CAVY

This large species of cavy has been acclimatised successfully both in England and in France

The HARES are a widely distributed group. They are found from the north of Scotland (where the gray mountain species turns white in winter) to the south of India, in South Africa, and across the continent of Asia to Japan. The MOUNTAIN-HARE takes the place of the brown species in Scandinavia, Northern Russia, and Ireland; it is rather smaller, and has shorter ears and hind legs.

As early as 54 B.C., Cæsar, in his account of Britain, writes that the COMMON HARE was kept by the ancient Britons as a pet, but not eaten by them. It was protected by the Normans in the second list, or schedule, of animals reserved for sport. The first list included the *Beasts of the Forest*, the second the *Beasts of the Chase*, of which the hare was one of the first. The word "chase" has here a technical meaning, by which was understood an open park, or preserved area, midway in dignity between a forest and an enclosed park. "Hare parks" were also made, perhaps the most recent being that made at Bushey for the amusement of the sovereign

and England. The flesh is like that of the rabbit.

The CAPYBARA is the largest of all rodents. This species is, in fact, a gigantic water guinea-pig. It is found in all the great rivers of South America, from the Orinoco to the La Plata. It swims as well as a water-rat, though it is as large as a small pig. It feeds on weeds, water-plants, and grass. A capital photograph of this animal appears on page 146.

PIKAS, HARES, AND RABBITS.

The last two families of the Rodents have a small pair of rudimentary incisor teeth behind the large ones in the upper jaw. The PIKAS, or CALLING-HARES, resemble the marmot tribe in general appearance. Their heads are short, their ears rounded, and, being tailless, they still less resemble the common hare; but their dentition marks them as allied. One species, about 9 inches long, is found in Siberia; and another, only 7 inches long, in the Rocky Mountains. The former has a habit of cutting grass and storing it in small stacks outside its hole for winter use; the Rocky Mountain species carries its hay into its burrows.



By permission of Professor Bumpus

[New York

WOOD-HARE

This is one of the forms intermediate between the hares and rabbits

CHAPTER X.

THE BATS AND INSECT-EATING MAMMALS.

BY W. P. PYCRAFT, A.L.S., F.Z.S.

THESE two groups are really closely allied; but the bats are generally considered apart, on account of their totally different mode of life. Originally, like their more commonplace relatives, they were dwellers upon the earth, or, more correctly, among the trees. By gradual modification of the fore limbs, and a corresponding development of folds of skin attached thereto, and to the body, they have acquired the power of flight. The cobeco, to be mentioned presently, gives us a hint of how this may have come about.

The bats are the only members of the Mammalia which possess the power of true flight. The so-called flying-squirrels do not rightly deserve this title, for they have no wings. The wings of the bat have been formed by modification of the fore limbs, the finger-bones having become excessively lengthened, so as to serve as a support to a thin web of skin extending outwards from the body, much as the ribs of an umbrella support the covering. The hand of the bat is therefore a quite unique organ.



Photo by W. Saville-Kent, F.Z.S.]

[Croydon

AUSTRALIAN FRUIT-BAT, OR "FLYING-FOX"

This photograph shows the "flying-fox" in its customary resting position. A photograph of it flying is shown on page v of Introduction



Photo by Henry King]

[Sydney

AUSTRALIAN FRUIT-BATS

In their roosting-places these bats hang all over the trees in enormous numbers, looking like great black fruits. Although shot in thousands, on account of the damage they do to fruit orchards, their numbers do not appear to be reduced

more common insect eating forms are found everywhere. Those forms with a restricted distribution are, it should be noticed, all highly specialised—that is to say, they have all become in some way adapted to peculiar local conditions, and cannot subsist apart therefrom. It is the more lowly—less specialised—forms which have the widest geographical range. There are some spots, however, on the world's surface from which no bat has yet been recorded—such are Iceland, St. Helena, Kerguelen, and the Galapagos Islands.

THE FRUIT-BATS.

These represent the giants of the bat world, the largest of them, the KALONG, or MALAY FOX-BAT, measuring no less than 5 feet from tip to tip of the wing. The best known of the fruit-bats is the INDIAN FOX-BAT. Sir J. E. Tennent tells us that a favourite resort of theirs near Kandy, in

The wing-membrane serves yet another purpose, for its sense of touch is exceedingly delicate, enabling even blind bats (for bats are not blind usually, as is popularly supposed) to avoid objects placed in their path. Some bats, however, appear to depend also in some slight degree upon hearing. The sense of touch is still further increased by the development of frills or leaf-like expansions of skin round the nose and mouth, and by the excessive development of the external ears. Delicate hairs fringing these membranes probably act like the "whiskers" of the cat.

Insect-eating bats inhabiting regions with a temperate climate must in winter, when food supplies cease, either hibernate or migrate to warmer regions. The majority hibernate; but two species at least of Canadian bats perform extensive migrations, it is supposed to escape the intense cold.

The power of flight has made the bats independent of the barriers which restrict the movements of terrestrial animals, and accordingly we find them all over the world, even as far north as the Arctic Circle. But certain groups of bats have an extremely restricted range. Thus the Fruit-bats occur only in the warmer regions of the Old World, the Vampires in America, whilst some of the



Photo by A. S. Rudland & Sons

TUBE-NOSED FRUIT-BAT

The tubular nostrils distinguish this and a species of insect-eating bat from all other living mammals



Photo by Fratelli Alinari]

[Florence

PIPISTRELLE BAT

This is one of the commonest bats. It is the first to appear in the spring, and the last to retire at the fall of the year

Ceylon, was some india-rubber-trees, "where they used to assemble in such prodigious numbers that large boughs would not infrequently give way beneath the accumulated weight of the flock." An observer in Calcutta relates that they occasionally travel in vast hordes, so great as to darken the sky. Whether they are performing some preconcerted migration or bent only on a foray to some distant feeding-ground is a matter for speculation. These hordes are quite distinct from the "long strings" which may be seen every evening in Calcutta on their way to neighbouring fruit-trees.

One of the most remarkable of this group is the TUBE-NOSED FRUIT-BAT, in which the nostrils are prolonged into a pair of relatively long tubes. Strangely enough, a group of insect-eating bats has developed similar though smaller tubes. Except in these bats, such tubes are unknown among mammals. Their function is not known.

INSECT-EATING BATS.

The vast majority of the bats comprising this group feed exclusively on insects. Some, however, have acquired the habit of fruit-eating, like the true fruit-bats; and a few have developed quite ogre-like habits, for they drink blood—indeed, they subsist upon nothing else. This they obtain from animals larger than themselves.

Many of the bats of this group have developed curious leaf-like expansions of skin around the nose and mouth, which are supposed to be endowed with a very delicate sense of touch. In some, as in the FLOWER-NOSED BAT, the nose-leaf is excessively developed, forming a large rosette. The upper border of this rosette is furnished with three stalked balls, the function of which it is surmised is probably ornamental—from the bat's point of view. To our more æsthetic taste the whole effect is hideous.

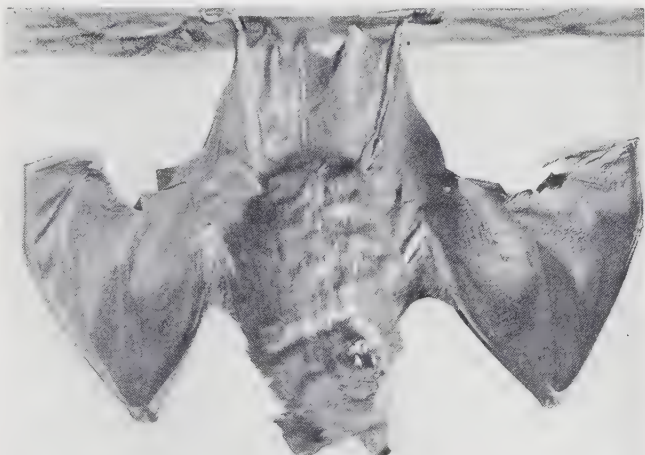


Photo by A. S. Rudland & Sons

LEAF-NOSED BAT

The leaf-nosed are the most highly organised of all the bats. The remarkable leaf-like folds of skin around the nose or chin, as the case may be, serve as delicate organs of perception. There are numerous species of leaf-nosed bats

Limited as is our space, we cannot pass over the SUCKER-FOOTED BATS. These are met with, strangely enough, in countries so far apart as Brazil and Madagascar. The suckers from which they derive their name, in the Brazilian species, are small circular, hollow disks, attached to the thumb and the sole of the foot, recalling the suckers of the cuttle-fish and brown water-beetle. By their means the animal is enabled to climb over smooth vertical surfaces.

A white bat is a rarity in the bat world. We cannot therefore afford to pass without mention the fact that Central and South America possess two species of WHITE BATS. This colour is probably developed for protection's sake, the bats being found nestling between the silvery leaves of a cocoanut-palm. Brilliant coloration, on the other hand, is by no means so rare. WELWITSCH'S BAT, for instance—a West African species—is remarkable for its gorgeous coloration, the colours being orange and black. An Indian species, known as the POINTED BAT, is said to be so brilliantly coloured as to resemble a gorgeous butterfly rather than a bat.

Ugliness is more common than beauty amongst the bats, and perhaps the ugliest of all the tribe is the NAKED BAT of the Malayan region. It is absolutely repulsive. The skin is naked, save for a collar of hair round the neck; whilst on the throat it gives rise to an enormous throat-pouch, which discharges an oily fluid of a peculiarly nauseating smell. On either side of the body is a deep pouch, in which the young are carried—a very necessary provision, for they would be quite unable to cling to the body of the parent, as do the young of fur-bearing bats, on account of the naked skin.

Of the great group of the VAMPIRE-BATS we can only make mention of the blood-sucking species. These are natives of South America. It is to Dr. Darwin that we owe our first absolutely reliable information about these little animals. Before the account in his *Journal*, it was uncertain to which of the vampires belonged the unenviable distinction of being the blood-sucker. During the stay of the great naturalist in Chili one was actually caught by one of his servants, as evening was drawing on, biting the withers of a horse. In the morning the spot where the bite had been inflicted was plainly visible, from its swollen condition. These two species, it has been stated, "are the only bats which subsist entirely on a diet of blood, yet it is possible that . . . some of the JAVELIN-BATS or their allies may on occasion vary their ordinary food with it."

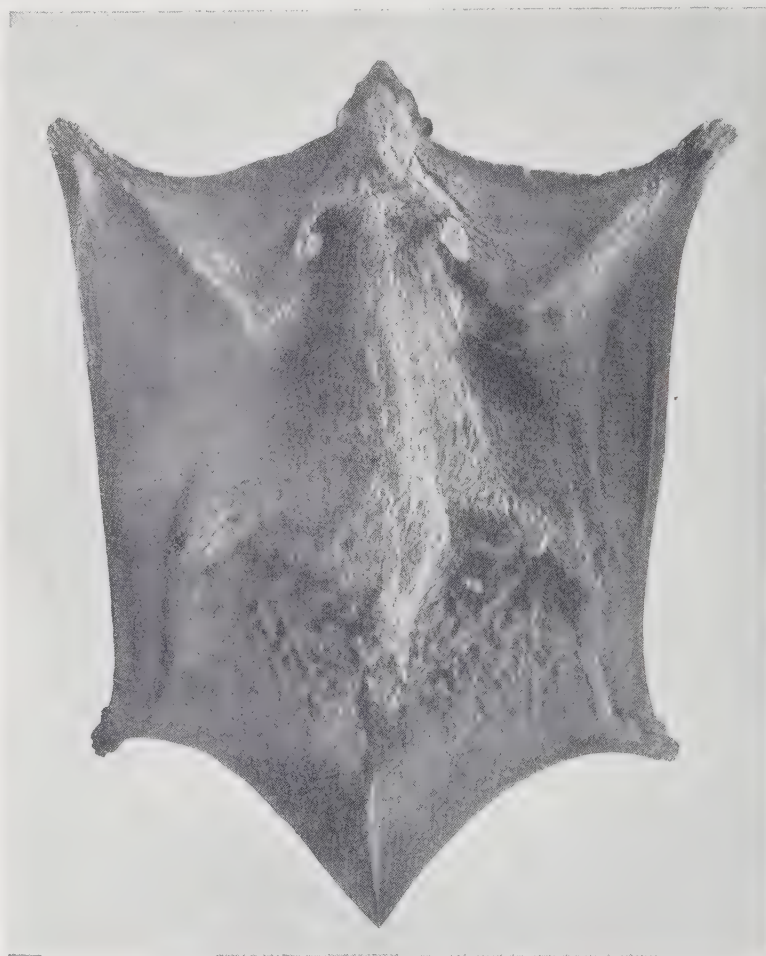


Photo by W. Saville-Kent, F.Z.S.]

[Croydon

COBEGO

Back view of the cobego, with the limbs extended, showing the great size of the flying-membranes, or parachute

THE INSECTIVORA, OR FLIGHTLESS INSECT-EATERS.

Some members of this group have departed from the traditional insect diet. Thus the cobego feeds upon leaves, a curious aquatic shrew—the Potamogale of West Africa—upon fish, and the moles upon worms.

The group has a very wide geographical distribution, but there are nevertheless large portions of the globe in which they are conspicuous by their absence. They are never found in Australia or South America. Madagascar, Africa, and the West India Islands produce the most remarkable forms.

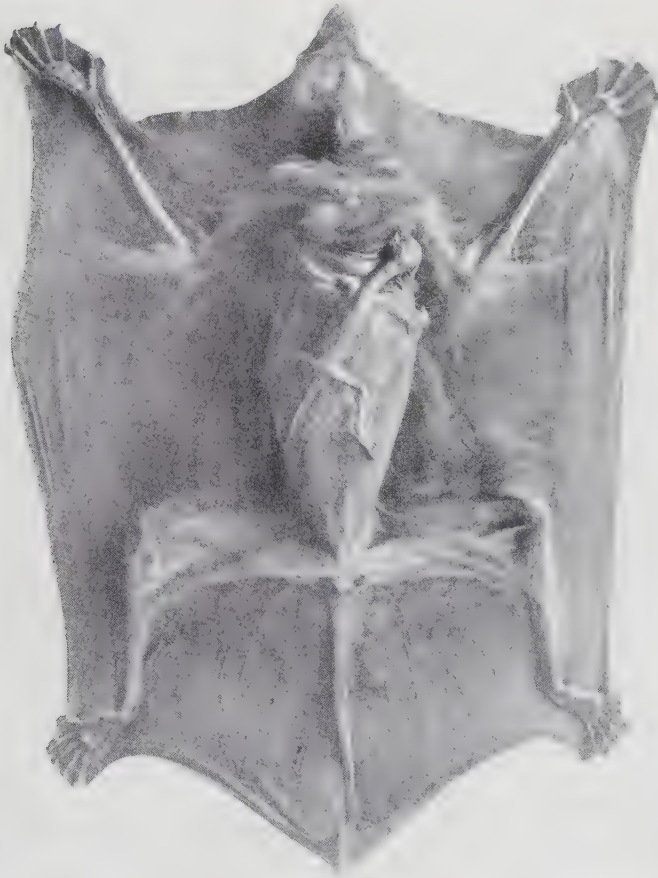


Photo by W. Saville-Kent, F.Z.S.]

[Craydon

COBEGO

Vertical (front) view of the cobego, with newly born and naked young attached. Note the extension of the membrane between the toes of the fore feet of the adult

THE COBEGO.

This is a peculiarly interesting animal, which lives in the forests of Sumatra, Borneo, the Malay Peninsula, and the Philippine Islands. It dwells among the trees, moving from one to another by taking flying leaps through the air, covering as much as seventy yards at a jump. Prodigious leaps like this would be quite impossible but for the fact that the animal, which is almost as large as a cat, is provided with a sort of parachute, formed by a broad web of skin stretched between the body on either side and the fore and hind limbs, and between the hind limbs and the tail.

SHREWS, HEDGEHOGS, AND TENRECS.

The variation in form presented by the members of this group is considerable. The most noteworthy examples of this variation are furnished by the pretty little squirrel-like TREE-SHREWS of India and Borneo and neigh-

bouring lands, the mouse-like JUMPING-SHREWS of Africa, the HEDGEHOGS, the TENRECS, the elegant little MOUSE-LIKE SHREWS of almost world-wide distribution, and the WATER-SHREWS. Of these, hedgehogs and tenrecs have undergone the greatest transformation. By a curious modification of their original hairy covering they have developed a formidable armour of sharp spines. When alarmed, the former roll themselves up into a ball by the contraction of powerful muscles, and so present an almost impregnable armour to an enemy. Stoats and foxes, however, appear at least occasionally to succeed in overcoming this defense and making a meal of the vanquished.

Tenrecs are found in Madagascar. The COMMON TENREC is the largest of all insect-eaters,



Photo by W. Saville-Kent, F.Z.S.]

[Croydon

COBEGO ASLEEP

All four limbs are used in suspending itself when asleep, as in the photo. In this position the cobego closely resembles, and is mistaken by its enemies for, the fruits of one of the native trees. It is a nocturnal animal.

so great is the ferocity displayed by the mole that if it could be magnified to the size of the lion it would be one of the most terrible of living creatures. That a constant supply of food is necessary to satiate its enormous appetite is shown by the fact that a mole will succumb to an abstinence of from ten to twelve hours. Moles fight among themselves furiously; and if two are confined together, the weaker will be attacked and devoured. They take readily to the water, and instances of moles observed in the act of crossing streams are numerous.

It is a curious fact, but the mole is unknown in Ireland; yet it ranges from England in the west through Asia to Japan.

Careful observation seems to have shown that with the common mole males are more numerous than females. Whether this is true of other species remains to be seen. The moles of North

and one of the most prolific, as many as twenty-one having been produced at birth. Of all living mammals it is the one most nearly allied to the Marsupials.

THE MOLES.

The COMMON MOLE shows a most perfect adaptation to its underground mode of life. The general form of the animal is long, cylindrical, and pointed in front, whilst the legs are exceedingly short, the foot only in the fore limb projecting from the body. This foot is very broad and spade-like and immensely powerful, its use being to force a way—often with incredible speed—through the soft, yielding soil, and not to support the body, as in running or walking. The hind feet are weak, but resemble those of its allies the shrews, for instance. The eyes have become reduced to mere vestiges, very difficult to find. The fur has become so altered in structure that it will lie equally smooth whether brushed towards head or tail, so that it should not be damaged when the animal travels backwards in its burrow. External ears have been dispensed with.

Worms form the staple diet of the mole, but besides underground insects of all kinds are greedily devoured. This animal is one of the most voracious feeders, falling ravenously upon its prey. It has been said with truth that

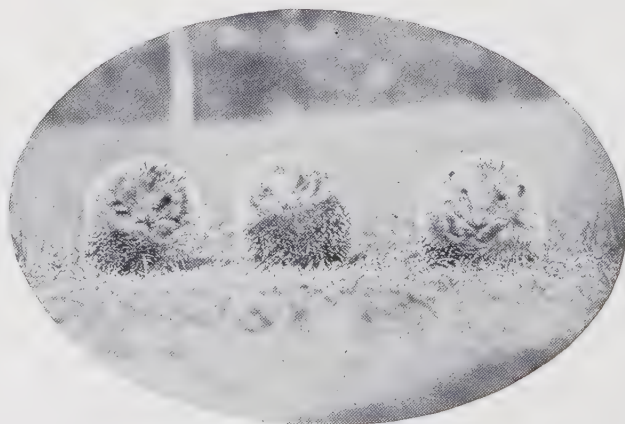


Photo by L. Medland, F.Z.S.]

[North Finchley

THREE BABY HEDGEHOGS

Young hedgehogs are born blind and naked. The spines on their first appearance are quite soft; they soon harden, and at the same time the power to roll the body up into a ball is acquired.



Photo by A. S. Rudland & Sons

COMMON MOLE

Note that this mole is changing its coat

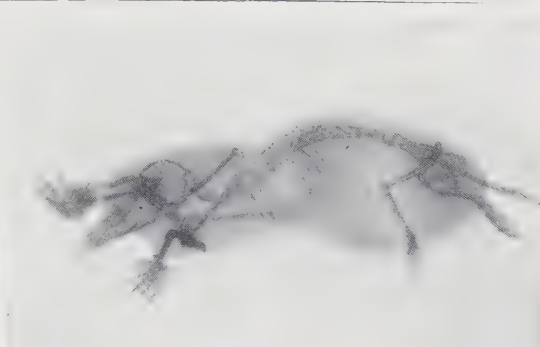


Photo by W. Saville-Kent, F.Z.S.]

COMMON MOLE

[Croydon

The skeleton is here revealed by the Röntgen rays

America form a group distinct from those of the Old World, though closely allied thereto. The WEB-FOOTED and the STAR-NOSED MOLES are the most interesting of the American forms.

Speaking of the prodigious speed with which these animals burrow their way through the ground, Dr. Hart Merriam remarks that in a single night, after rain, they have been known to make a gallery several yards in length, and that he had himself traced a fresh tunnel for nearly a hundred yards. As he says, we can only appreciate the magnitude of this labour by comparison, and "computation shows that, in order to perform equivalent work, a man would have to excavate in a single night a tunnel thirty-seven miles long, and of sufficient size to easily admit of the passage of his body."

The star-nosed mole is peculiar in that its nose is surrounded by a ring of finger-like processes, forming a kind of rosette, which probably acts as a highly sensitive organ of touch; furthermore, it differs from other moles in the great length of its tail, which is nearly as long as its body. Like the mole, this species makes its way through the ground with great speed.

Beneficial as moles undoubtedly are in destroying worms and obnoxious insects, yet they are regarded as a pest both by the farmer and gardener. That there is some justification for this dislike must be admitted; for the farmer suffers in that, in the search for food, crops are damaged by cutting through the roots of plants—the gardener not only for the same reason, but also because the ridges and hillocks which they make in their course disfigure the paths and beds of a well-kept garden.

The nearest allies of the moles are the curious aquatic DESMANS of Russia, and the SHREWS, some of which are form, owing to their similar mode of

The BURROW-the only forms in the have assumed a allied to the hedge-is a remarkable the GOLDEN MOLE. of the body of this instance of adapta-mode of life. The golden mole is claws, which are purposes; the hand out spade-like, as in the claws rendering



Photo by A. S. Rudland & Sons

GOLDEN MOLE

This is found only in South Africa. The name is derived from the wonderful metallic lustre of the fur: the brilliancy of the hues is intensified by immersion in spirit

quite mole-like in having adopted a life.

ING SHREWS are not great group which mole-like shape, for hog-like TENRECS animal known as The molelike shape animal is another tion to a similar fore limb of the provided with huge used for digging is not broadened the common mole, this unnecessary.

CHAPTER XI.

THE ELEPHANT, TAPIR, HYRAX, AND RHINOCEROS.

THE ELEPHANT.

BY F. C. SELOUS.



Photo by M. E. F. Baird, Esq.

A FINE TUSKER

*The male Indian elephant has smaller tusks
than the African species*

AT once the mightiest and most majestic of all terrestrial mammals, the elephant appeals to the imagination more forcibly than any other living animal, not only on account of its great sagacity and the strangeness and singularity of its outward appearance, but also because it is such an obvious link between the world of to-day and the dim and distant past of Pleiocene and Miocene times.

There are two existing species of elephant, the AFRICAN and the ASIATIC, the latter, from the structure of its molar teeth and the shape of its skull, appearing to be very nearly related to the MAMMOTH, which lived upon the earth in comparatively recent times—geologically speaking—and was undoubtedly contemporary with man in Europe during the Stone Age.

There are very considerable differences both in the external appearance and also in the habits of the two existing forms of elephant. In the African species the forehead is more convex and the eye relatively larger than in its Asiatic cousin; and whilst the ears of the latter are only of moderate size, those of the former are so large that they at once arrest the attention, and are one of that animal's most remarkable external characteristics. Both sexes of the African species, with few exceptions, carry well-developed tusks, but in the Asiatic form the tusks of the females are so small as scarcely to protrude beyond the jaws. In Asia, too, tuskless bull elephants are common, whilst males of the African species without tusks are extremely rare. The latter species has but three nails on the hind foot, the Asiatic elephant four. In the African species the middle of the back is hollowed, the shoulder being the highest point, whilst in the Asiatic

elephant the back is arched, and the top of the shoulder lower than the highest part of the back. The extremity of the proboscis is also different in the two species, the African elephant being furnished with two nearly equal-sized prolongations, the one on the front, the other on the hinder margin, with which small objects can be grasped as with the finger and thumb of the human hand, whilst in the Asiatic species the finger-like process on the upper margin of the end of the trunk is considerably longer than that on the under-side. In external appearance the skin of the African elephant is darker in colour and rougher in texture than that of the Asiatic form. The molar teeth of the former animal are, too, of much coarser construction, with fewer and larger plates and thicker enamel than in the latter, which would naturally lead one to suppose that the



Photo by Fratelli Alinari]

[J. W. H. S.]

A YOUNG INDIAN ELEPHANT

This animal has been trained to "salute" by raising its trunk and foot. It has lost the end of its tail

African elephant is accustomed to eat coarser, harder food than the Asiatic species. This supposition is borne out by fact; for whilst the Asiatic elephant feeds mainly upon grass, the leaves and fruit of the wild plantain, and the young shoots of the bamboo, together with the leaves, twigs, and bark of certain trees, the African species never eats grass, and, although very fond of certain kinds of soft and succulent food, such as wild fruits and the inner bark of certain trees, is constantly engaged in chewing up the roots and branches of trees as thick as a man's wrist for the sake of the sap and bark, the woody portions being rejected after having been reduced to pulp. The Asiatic elephant appears to be far less tolerant of exposure to the heat of the sun than the African; and whilst the latter may often be found standing at rest or sleeping throughout the hottest hours of the day in long grass or scrubby bush of a height not sufficient to afford any protection from the sun to the whole of the upper portion of the head and body, the former, when in a wild state, is said to always seek the shade of the densest forests it can find during hot weather.

The Asiatic elephant often lies down when resting and sleeping. This is in marked contrast to the African species, which, if it ever does lie down at all, except to roll in mud or rub itself against an ant-heap, can only do so very rarely, since in all my experience, though I have seen some thousands of African elephants standing sleeping during the heat of the day, I have never yet seen one of these animals lying down, nor found the impress in the ground where one had been so lying.

When excited and charging, both species of elephant raise their heads and cock their ears, which in the African animal stand out at such a time like two sails, and, being each upwards of $3\frac{1}{2}$ feet in breadth, cover, together with the animal's head, an expanse of fully 10 feet. The Asiatic elephant is said to remain mute whilst charging, and to hold its trunk tightly curled up between its tusks. The African elephant, on the other hand, usually accompanies a charge with a constant succession of short, sharp trumpeting screams. Sometimes, though rarely, however, animals of this species remain mute whilst charging, but they never, I believe, coil their trunks up under their throats. Often an African elephant will swing round for a charge with a loud scream and trunk held high in the air; but in my experience, when settling down to a chase, it drops its trunk and holds it pointing straight down in front of its chest.

In the southern portions of the African Continent the average standing height at the shoulder of full-grown bull elephants ranges from 10 feet to 10 feet 6 inches, though individuals have doubtless been met with in those districts which have much exceeded these dimensions. In North Central Africa the average standing height appears to be some inches higher, approaching 11 feet, and in those districts it is quite possible that individuals exist which exceed 12 feet in height. African cow elephants stand from 8 feet to 8 feet 6 inches at the shoulder. The Asiatic species is considerably smaller than the African, the average height of full-grown males not exceeding 9 feet, though certain individuals now and then attain to a much greater size, as is indicated by the fact that there is a mounted skelton of an Indian elephant in the Museum at Cal-



Photo by M. E. F. Baird, Esq.

THE CHIEF OF CHIENGMAI'S CARRIAGE

This victoria was drawn by a young Indian elephant



Photo by M. E. F. Baird, Esq.

TIMBER-ELEPHANTS

This photograph was taken at Lakou, in Upper Siam. Notice the large teak log in the foreground

cutta which stands 11 feet 3 inches at the shoulder. In the size of its tusks the African elephant far surpasses the Asiatic species. In India a pair of tusks measuring 5 feet in length and weighing 70 lbs. the pair would, I think, be considered large, though an elephant was killed by Sir Victor Brooke in the Garo Hills with a single tusk measuring 8 feet in length, 17 inches in circumference, and weighing 90 lbs., and a few tusks even exceeding these dimensions have been recorded. In Southern Africa the tusks of full-grown bull elephants usually weigh from 80 to 120 lbs. the pair, and measure about 6 feet in length, with a circumference of from 16 to 18 inches; but these weights and measurements have often been much exceeded, and in my own experience I have known of two pairs of elephants' tusks having been obtained south of the Zambesi, each of which weighed slightly over 300 lbs., each tusk measuring upwards of 9 feet in length, whilst a single tusk brought from the neighbourhood of Lake Ngami in 1873 weighed 174 lbs. The average weight of cow-elephant tusks in Southern Africa is from 20 to 30 lbs. the pair, but I have seen the tusk of a cow elephant killed in Matabililand which weighed 39 lbs. and measured over 6 feet in length, whilst its fellow almost equaled it in size and weight. In North Central Africa, according to Sir Samuel Baker, the tusks of full-grown elephants average about 140 lbs. the pair, and tusks weighing upwards of 100 lbs. each are not at all uncommon, whilst many of a much greater size have been obtained.

Until quite recently a tusk in the possession of Sir E. G. Loder, which weighs 184 lbs. and measures 9 feet 5 inches in length, with a circumference of $22\frac{1}{2}$ inches, was supposed to be the largest in existence; but in 1899 two tusks were obtained near Kilimanjaro, in East Central Africa, both of which much exceed this weight. These enormous tusks were at first stated to be a pair taken from a single elephant; but though nearly equal in weight they are said to be differently shaped, and as their history is not yet fully known it is possible, though not probable, that they originally belonged to two different elephants. The larger of these two tusks has recently been purchased for the collection of the British Museum (Natural History), where it may now be

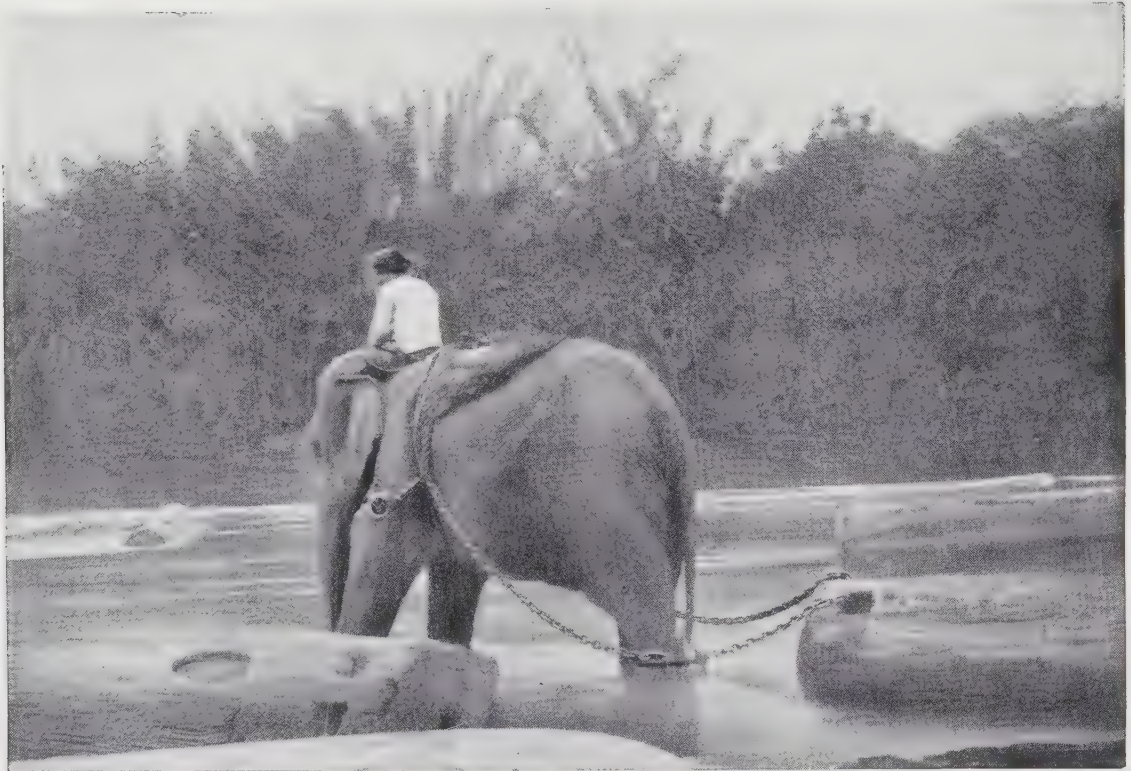


Photo by M. E. F. Baird, Esq.

FEMALE INDIAN ELEPHANT DRAGGING TEAK

The teak logs are floated down the Burmese rivers and dragged out by elephants

seen. It weighs 228 lbs., measures 10 feet $2\frac{1}{2}$ inches on the outside curve, and $24\frac{1}{4}$ in girth at the thickest part. The tusks of cow elephants are also considerably larger and heavier on the average in East Central and North Central Africa than in the southern portions of the continent.

At the present time the Asiatic elephant is found in a wild state in most of the forest-covered tracts of India, Ceylon, Assam, Burma, Siam, Cochin-China, Sumatra, and Borneo; whilst the African species, although it has been hunted out of large tracts of country in South and Southwestern Africa, still inhabits the greater part of the continent south of the Sahara, and in many districts of Central Africa appears to be extraordinarily abundant. In the Cape Colony two herds still exist under the protection of the Government.

As might be expected from the greater length of its legs, and consequent longer stride, the African elephant is admitted by those who have had experience of both species to be a more active animal than its Asiatic cousin. Speaking of the walking and running powers of the Indian elephant, that great authority Mr. Sanderson says that "the only pace of the elephant is the walk, capable of being increased to a fast shuffle of about fifteen miles an hour for very short distances. It can neither trot, canter, nor gallop. It does not move with the legs on the same side, but nearly so. A very good runner might keep out of an elephant's way on a smooth piece of turf, but on the ground in which they are generally met with any attempt to escape by flight, unless supplemented by concealment, would be unavailing." This description exactly coincides with my own experience of the African elephant, except that I think that animals of the latter species, especially cows and young bulls, are capable of getting up a pace of at least twenty miles an hour, and keeping it up for from 100 to 200 yards, when charging.

In disposition both African and Asiatic elephants are as a rule timid animals, and, excepting in the case of males of the latter species when suffering from sexual excitement, are always inclined to shun danger. I have never heard of male elephants of the African species becoming savage and aggressive at any season of the year; indeed, old bulls always appeared to me to be less inclined to charge than cows or young bulls. The eyesight of the elephant—of the African species at least—is bad, and his hearing not particularly acute; but his olfactory nerves are probably more highly developed than in any other animal, and, aided by this exquisite sense of smell, he will avoid a human being if possible. But if elephants are attacked and wounded, they become savage and dangerous animals; and the charge of an African elephant, coming on with the great ears outspread, to the accompaniment of a quick succession of short, sharp trumpeting screams, besides being very sudden and rapid, is very disconcerting to the nerves of a man unaccustomed to such experiences. I remember the case of a young Englishman who was killed in Matabililand many years ago by the first elephant he had ever seen. This animal—an old bull—had retired, after having been wounded, into a small but dense patch of thorn-bush, into which its pursuer thought it inadvisable to follow on horseback. He therefore left his horse, and advanced on foot towards the cluster of trees amongst which the elephant was concealed. The latter, having either seen or smelt the approaching enemy, at once charged out, screaming loudly; and the young hunter, instead of standing his ground and firing at the advancing monster, lost his presence of mind, and, turning, ran for his horse; but before he reached it he was overtaken and killed. It seemed to the friend who found his body (he was close at hand shooting another elephant at the time, and pieced the story together from the tracks of man, horse, and elephant) that the victim had first been struck in the back of the head by one of his pursuer's tusks—at any rate his skull had been smashed to pieces and emptied of its brains. Then the elephant had rushed upon him where he fell, and, after first having driven a tusk right through his chest and deep into the ground, had stamped him into a bloody pulp with his huge



Photo by M. E. F. Baird, Esq.

INDIAN ELEPHANTS BATHING

These animals love a bath, and will walk on the bottom of a deep river with only their trunks raised above the water

feet. A waggon was brought the same night, and the mangled body carried to the hunter's camp on the banks of the Ramokwebani, where it was buried.

The strength of the elephant is proverbial; and in India and Burma, where this animal has for ages past been trained in the service of man, this power is habitually made use of in moving and stacking large baulks of timber, or in dragging heavy guns through muddy ground or up steep ascents. In Africa the traveler is often astonished at the size of trees which have been uprooted and overturned by elephants. These trees, however, have no tap-root, and have not therefore a very firm hold in the ground, especially during the rainy season, when the ground is soft. At this time of year large trees are butted down by elephants, which push against their stems with the thick part of their trunks, and get them on the swing, until the roots become loosened and the trees are at last overturned. Small trees of 2 or 3 inches in diameter, as well as branches, they break off with their trunks. In 1878 a tuskless bull elephant—I met the same animal again in 1885, and he is the only African bull elephant without tusks I have ever seen—killed a native hunter in Mashonaland. This man, a big powerful Zulu and a great friend of my own, was torn into three pieces. I imagine that, after having caught him, the elephant held the unfortunate man down with his foot or knee, and then, twisting his trunk round his body, tore him asunder—surely a terrible exhibition of strength.

The elephant is a very slow-going and long-lived animal, not arriving at maturity until upwards of thirty years of age; and since cases are on record of elephants having lived for upwards of 130 years in captivity in India, it is probable that in a wild state these animals, both in Asia and Africa, often attain to an age of 150 years. The female elephant produces, as a rule, but one calf at birth, the period of gestation lasting from eighteen to nearly twenty-two months. The mammæ of the cow elephant are placed between the fore legs, and the new-born calf sucks with its mouth, holding its trunk turned back over its head. I have seen elephant calves so engaged.

Although there is no reason to doubt that the African elephant is as intelligent as the Asiatic species, its domestication has never been attempted by the Negro or Bantu races of Africa. It is believed, however, that the African elephant was in ancient times domesticated by the Carthaginians, and used by them in their wars with the Romans. The opinion, too, is generally held that the elephants with which Hannibal crossed the Alps were of the African species, as well as those which, after the conquest of Carthage, were used in the Roman amphitheatres and military pageants. On the other hand, it is well to remember that the late Mr. W. Cotton Oswell, who had had great experience both with African and Asiatic elephants, wrote as follows on this subject: "I believe some people suppose the Carthaginians tamed and used the African elephant they could hardly have had mahouts Indian fashion, for there is no marked depression in the nape of the neck for a seat, and the hemming of the ears when erected would have half smothered them. My knowledge does not allow me to raise any argument on this point; but might not the same market have been open to the dwellers at Carthage as was afterwards to

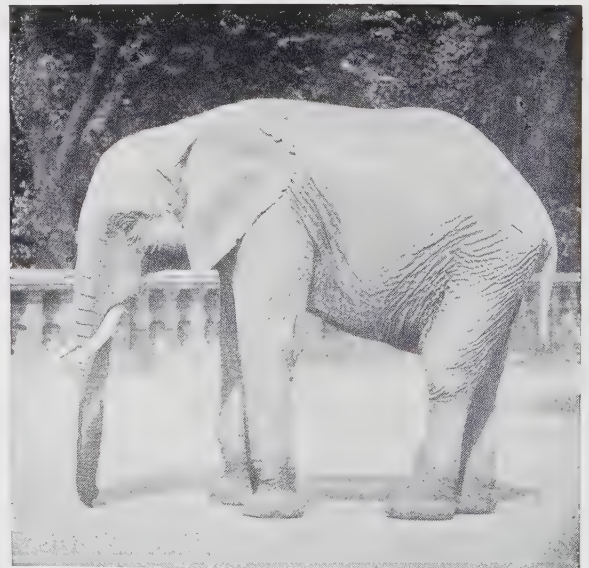


Photo by J. W. McLellan]

[Highbury

AFRICAN ELEPHANT

The difference in profile between this and the Indian species is noticeable. The forehead is receding and the ears much larger in the African species

Mithridates, who, I suppose, drew his supply from India? I know in the representations of elephants on the medals of Faustina and of Septimus Severus the ears are African, though the bodies and heads are Indian; but these were struck nearly 400 years after Carthaginian times, when the whole known world had been ransacked by the Romans for beasts for their public shows; and I still think it possible that the Carthaginians—the great traders and colonisers of old—may have obtained elephants through some of their colonies from India.”

An interesting example of the intelligence of these animals can be seen any day at the public Zoological Gardens. A large African elephant restores to his would-be entertainers all the biscuits, whole or broken, which strike the bars and fall alike out of his reach and theirs in the space between the barrier and his cage. He points his trunk at the biscuits, and

blows them hard along the floor to the feet of the persons who have thrown them. He clearly knows what he is doing, because, if the biscuits do not travel far enough, he gives them a harder blow.



Photo by L. Medland, F.Z.S.]

[North Finchley]

MALE AFRICAN ELEPHANT DRINKING

Note the great size of the tusks and base of the trunk

TAPIRS AND HYRAX.

BY W. P. PYCRAFT, A.L.S., F.Z.S.

TAPIRS are odd-looking creatures, and, strange as it may seem, are nevertheless related on the one hand to the rhinoceroses, and on the other to the horses. They are furthermore extremely interesting animals, because they have undergone less modification of form than any other members of the group to which they belong. This we know because fossil tapirs, belonging to a very remote period of the world's history, are practically indistinguishable from those now living.

The general form of the body may perhaps be described as pig-like; the head, too, suggests that animal. But the pig's snout is here produced into a short proboscis, or trunk. The feet are quite unlike those of the pig, and resemble those of the rhinoceros. The fore feet have each four and the hind feet three toes; these are all encased in large horse-like hoofs. The tail is reduced to a mere stump.

Tapirs are shy and inoffensive animals, living in the seclusion of dense forests in the neighbourhood of water, in which element they are quite at home; indeed, it is said that they will frequently dive and walk along the bed of the river. They are also fond of wallowing in mud.

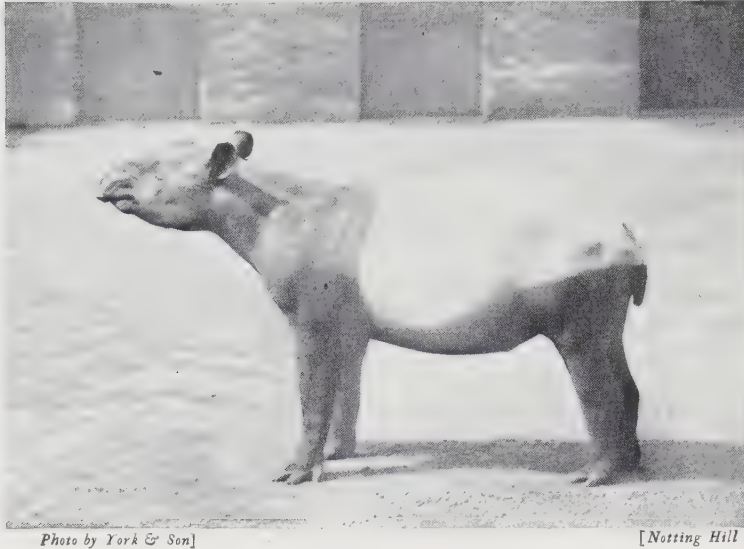


Photo by York & Son]

[Notting Hill

MALAYAN TAPIR

The largest of all the tapirs. Is easily distinguished from the American tapirs by the patch of white on the middle of its body

partly, it is believed, that they may encase themselves with it as a protection against the annoyance of flies. They feed on shoots of trees, bushes, leaves, and fallen fruits, foraging during the evening, and possibly far into the night.

Tapirs are hunted by the natives for the sake of their thick hides, which are cut into thongs for reins and bridles. The flesh also is esteemed by some. There are three methods of capture. In South America the lasso is used with occasional success. But when not foiled by undergrowth, the hunter often loses his victim by reason of the vio-

lence and force of its rush, which snaps the thong. The Gauchos intercept it with dogs on its way to the water, when it will fight furiously, and many dogs may be killed before its dispatch is accomplished. Others imitate its peculiar, shrill call, and shoot it on its approach in answer thereto. Captives are easily tamed, and may be seen walking about the streets in many South American towns. They wander into the forest by day, returning in the evening to be fed, and are said to display great affection. On account of their great strength, it has been suggested that such captives should be used as beasts of burden.

Except the MALAYAN TAPIR, which is black and white, tapirs are black or dark brown in colour, and but scantily clothed with hair; but the young, it is interesting to note, are spotted and striped with white or fawn-colour on a dark ground, a coloration recalling that of the wild pig.

There are five different species of tapir. Their geographical distribution is remarkable, four species being South American, and one belonging to the Malayan region. But far back in the world's history, as we know from fossils, tapirs roamed over the warm and temperate regions of Europe, and their remains have been found in China and the United States. Thus the intervening gaps existing to-day have been made by the extinction of these intermediate species.

By nature the tapir appears to be a harmless and inoffensive animal, flying even before the smallest dog. Occasionally, however, it displays great courage and ferocity, and this appears to be especially the case with females deprived of their young. At such times they will charge with great spirit, and knock down, trample on, and bite their victim after the fashion of wild swine.

Man alone excepted, the most deadly foe of the AMERICAN TAPIR is the jaguar, as is the tiger of the Malay species. The American tapir often gets rid of the jaguar by rushing at full speed into the dense jungle, thus sweeping its assailant from its back, the jaguar's claws finding but an insecure hold on its victim's thick hide. Tapirs are often found bearing scars all over the back, witnessing the terrible nature of the wounds received at such times.

That the tapir is a comparatively unknown animal is partly accounted for by the fact that it is but little sought after by the big-game hunter—who finds more excitement in pursuit of its larger relative the rhinoceros—and partly, perhaps, owing to its inhabiting regions comparatively little visited by Europeans. Nevertheless, the tapir is an animal of quite peculiar interest, having undergone but little change during long ages, whilst its ally the horse has effected in the same time a complete transformation, not only in its general shape, but more especially in its teeth and

feet. The gradual steps by which this transformation has been brought about we can trace through certain fossil forms, of which we can say little here.

Amongst these fossils occur remains of an animal bearing a very strong resemblance to the living tapir, but which, strangely enough, is not really so closely related thereto as to the horses. It does not, however, stand in the direct line of descent of these latter, but must be regarded as representing a collateral branch thereof. The occurrence of this distinct tapir-like animal is of great scientific interest.

The short, stout legs and spreading toes of the living tapirs, rhinoceroses, and ancestral horse are admirably adapted for plodding deliberately over soft and yielding ground, such as is afforded by reed-beds and banks of rivers, or the shady depths of forests. Speed in such surroundings is not necessary, food in plenty being always at hand, and escape from enemies being sought by concealment in thick herbage rather than flight. With a migration to drier and higher plains, the spreading foot has undergone a change. The short legs and numerous toes have given place to long ones, and of the several toes growth has taken place in one only—the third; whilst the others have slowly dwindled, till eventually only traces of the second and fourth remain, as in the modern horse. Thus has a firmer support over hard, unyielding ground been brought about, and great speed gained. The animals with this type of foot (in which the third is the largest toe) are known as the Odd-toed Hoofed Animals. The pigs, sheep, deer, and oxen have gained an equally efficient foot, yet retaining four toes. Of these, the third and fourth are equal in size, and serve as a support to the body, whilst the second and fifth have now become functionless, and do not reach the ground. This type of foot characterises that group of the hoofed animals known as the Even-toed.

THE HYRAX.

This is one of the most remarkable of living mammals, and one of the greatest puzzles to zoologists, having no near living relatives. Though bearing some resemblance to an earless rabbit, it really belongs to the hoofed animals, and amongst them comes perhaps somewhat nearer the rhinoceros than to any other animal. It is the CONEY of the Bible. It inhabits the rocky districts of Syria and parts of Africa. It is a vegetable-feeder, and very wary. About a dozen species are known.



Photo by G. W. Wilson & Co., Ltd.]

COMMON AMERICAN TAPIR

This tapir inhabits tropical America. It is a nocturnal animal, frequenting the depths of shady forests in the neighbourhood of water, to which it frequently resorts for the purpose of bathing, or as a refuge from pursuit

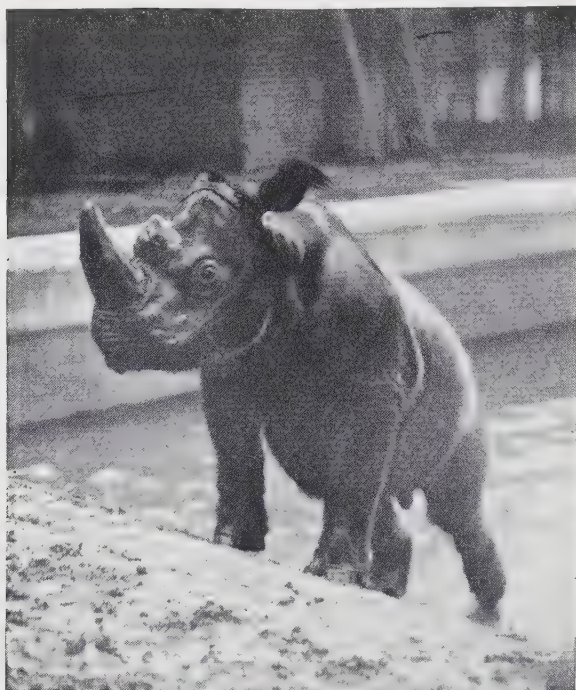


Photo by W. P. Dando

HAIRY-EARED SUMATRAN RHINOCEROS

This species is found in Eastern Bengal and in the Malay Peninsula and adjacent large islands

THE RHINOCEROS.

BY F. C. SELOUS.

OF the five existing species of RHINOCEROS, three are found in Asia, whilst two are inhabitants of Africa.

Of the three Asiatic species, two, the INDIAN and the JAVAN, are one-horned, and have a single pair of broad incisor teeth in the upper jaw, and a pair of sharp-edged and pointed tusks in the lower, the nasal bones being long and narrow, and terminating in a point. In both these species the skin is hairless (except for tufts or fringes at the extremity of the tail and on the edges of the ears), and is arranged in shield-like folds over the body. The arrangement of these folds, however, differs somewhat in the two species, and the large round tubercles with which the skin of the great Indian rhinoceros is profusely studded are wanting in the Javan species.

The INDIAN RHINOCEROS inhabits the Terai at the foot of the Himalaya from Bhutan to Nepal, and is said to be very abundant in Assam and the Bhutan Dooars. It frequents

swampy ground, and lives amongst jungles and dense growths of reeds and grass, which attain a height sometimes of 20 feet, and cover vast areas of ground in the valley of the Brahmaputra and other rivers.

Owing to the nature of the country in which it lives, the Indian rhinoceros cannot often be hunted with much prospect of success, except with the aid of elephants, which sagacious animals are not only employed to carry the hunters, but are also used to beat the great grass jungles in which the rhinoceroses lie hidden, and drive them towards the guns.

Despite its great size and strength, the Indian rhinoceros seems to be regarded as, in general, a timid and inoffensive animal, and even when wounded it seldom charges home. Elephants, however, appear to be as a rule nervous when in the near proximity of rhinoceroses, perhaps objecting to the smell of those animals. When the Indian rhinoceros does make good its charge against either man or elephant, it cuts and rips its enemy with its teeth, and makes little use of its horn as an offensive weapon.

The Indian rhinoceros is said to live principally, if not entirely, on grass and reeds. As a rule it is a solitary animal, but sometimes several are found living in a comparatively small extent of grass-covered plain.

Large males of this species will stand from 5 feet 9 inches to 6 feet at the shoulder, and they are enormously bulky. Both sexes carry well-developed horns, which, however, do not usually attain a length of upwards of 12 inches. There is a specimen in the British Museum measuring 19 inches, and it is believed that in very exceptional instances a length of 2 feet has been attained.

The JAVAN RHINOCEROS, though it has been called the Lesser Indian Rhinoceros, is said by a late authority—Mr. C. E. M. Russell—to stand about the same height at the shoulder as the Indian species. It is found in the Sunderbunds of Eastern Bengal, and has been met with in the Sikhim Terai and in Assam, ranging eastwards through Burma and the Malay Peninsula to Sumatra, Java, and Borneo.



[Photo by J. H. M. T. Lellan]

[H. J. Lellan]

GREAT INDIAN RHINOCEROS

The largest land mammal of the East after the elephant

But little appears to be known of the habits of this species of rhinoceros. Although it is found in the swampy grass-covered plains of the Sunderbunds, its more usual habitat seems to be hilly forest-covered country, and both in Burma and Java it ascends to a height of several thousand feet above sea-level. It feeds principally upon leaves and the young shoots of trees and bushes. In disposition it is timid and inoffensive. Only the male carries a horn, which, being very short, is a very poor trophy for a sportsman.

The third Asiatic species of rhinoceros, known as the SUMATRAN, is the smallest of all living rhinoceroses. This species carries two horns, and its skin, which is very rough, is usually thinly covered with hair of a dark brown colour and of considerable length. The folds in the skin of the Sumatran rhinoceros are not nearly so well developed as in its single-horned relatives, and the one behind the shoulders is alone continued over the back. Although furnished with tusks in the lower jaw, the small pair of incisor teeth, which in the other two Asiatic rhinoceroses are always present in front of these tusks, are wanting in the Sumatran species.

The Sumatran rhinoceros is rare in Assam, but is found in Burma and the Malay Peninsula, as well as in Siam, Sumatra, and Borneo. The two horns of this species are placed at some

distance apart. Although they are as a rule very short, the front horn occasionally grows to a considerable length, sweeping backwards in a graceful curve.

In height adult males of the Sumatran species stand on the average from 4 feet to 4½ feet at the shoulder, and females sometimes not more than 3 feet 8 inches.

Like the Javan rhinoceros, the Sumatran species is by preference an inhabitant of hilly, forest-covered country, and browses on the leaves and shoots of trees and bushes. It is a timid and inoffensive animal, soon becoming tame in captivity. Its flesh is said to be much appreciated by the Dyaks of Borneo; and as its horns are

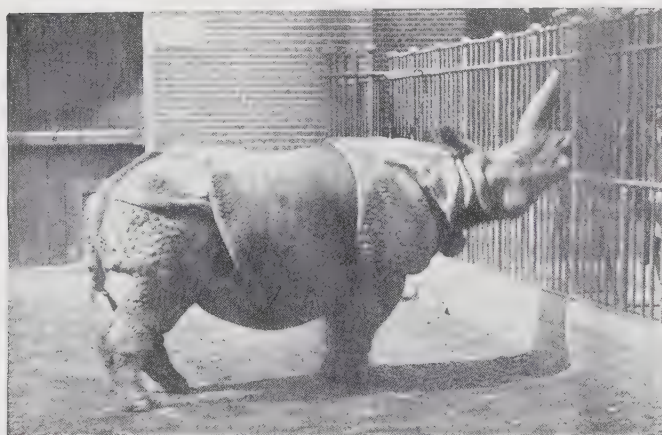


Photo by York & Son]

[Notting Hill

GREAT INDIAN RHINOCEROS

This species inhabits the grass jungles of Northeastern India

of value for export to China, where they are used for medicinal purposes, it has of late years very much decreased in numbers in the province of Sarawak, but is more plentiful in Central and North Borneo. Living as it does in dense jungle, it is an animal which is seldom seen by European sportsmen, and its habits in a wild state have never been yet very closely studied.

Turning to the two species of rhinoceros which inhabit the continent of Africa, both are double-horned, and neither furnished with incisor teeth, the nasal bones being thick, rounded, and truncated in front. Both, too, are smooth-skinned and entirely hairless, except on the edge of the ears and extremity of the tail, which are fringed or tufted.

Of the two African species, the WHITE or SQUARE-MOUTHED RHINOCEROS is the larger and the rarer. Until quite recently the range of this huge ungainly-looking animal, the biggest of all terrestrial mammals after the elephant, was supposed to be entirely confined to the southern portions of the African Continent; for although from time to time horns had found their way to Zanzibar which seemed referable to the square-mouthed rhinoceros, the fact of the existence of the white rhinoceros in any part of Africa north of the Zambesi remained in doubt until a female was shot in the year 1900, in the neighbourhood of Lado, on the Upper Nile, by Captain A. St. H. Gibbons, who brought its skin, skull, and horns to England. The fact, however, that the



Photo by C. B. Hausburg, Esq.

BLACK AFRICAN RHINOCEROSES

A splendid snapshot of two black African rhinoceroses taken on the open veldt. They were afterwards shot by the party

white rhinoceros has never been encountered by any other traveler in Central Africa seems to show that the animal is either very rare in those districts, or that it has an exceedingly limited range.

In the early years of the nineteenth century the square-mouthed or white rhinoceros was found in large numbers over the whole of South Africa from the Orange River to the Zambesi, except in the waterless portions of the Kalahari Desert, or those parts of the country which are covered with rugged stony hills or dense jungle.

Speaking of his journey in 1837 through the western part of what is now the Transvaal Colony, Captain (afterwards Sir) Cornwallis Harris wrote: "On our way from the waggons to a hill not half a mile distant, we counted no less than twenty-two of the white species of rhinoceros, and were compelled in self-defense to slaughter four. On one occasion I was besieged in a bush by three at once, and had no little difficulty in beating off the assailants." Even so lately as thirty years ago the white rhinoceros was still to be met with in fair numbers in Ovampoland and other districts of Western South Africa, whilst it was quite plentiful in all the uninhabited parts of Eastern South Africa from Zululand to the Zambesi. In 1872 and 1873, whilst elephant-hunting in the uninhabited parts of Matabililand, I encountered white rhinoceroses almost daily, and often saw several in one day. At the present time, however, unless it should prove to be numerous in some as yet unexplored districts of North Central Africa, this strange and interesting animal must be counted one of the rarest of existing mammals, and in Southern Africa I fear it must soon become extinct. A few still exist amongst the wild loquat groves of Northern Mashonaland, and there are also a few surviving in Zululand; but I fear that even with the most rigid protection



Photo by C. B. Hausburg, Esq.

ONE OF THE SAME RHINOCEROSES DEAD

This picture gives some idea of the size of the commonest surviving species



Photo by J. W. McLellan]

[Highbury

RHINOCEROS BATHING

All the Asiatic species of rhinoceros are fond of bathing and wallowing in mud

might measure from 18 inches to 40 inches in length; those of cows from 24 inches to 60 inches. The longest horn known—that of a cow—which was brought from South Africa by the well-known hunter the late Roualeyn Gordon Cumming, measures 62½ inches over the curve. As a rule, the front horn of the white rhinoceros curved slightly backwards, but was often straight or bent slightly forwards, and sometimes curved strongly backwards. The posterior horn varied from a few inches to 2 feet in length.

The white rhinoceros lived in families, usually a bull, cow, and calf being found together; but there might be two or even three calves of different ages, and of which the youngest alone would be suckling, living with the father and mother. In the early South African spring (September and October), when the young green herbage was just sprouting after the first rains, two or three families of white rhinoceroses might be seen feeding in close proximity, presenting the appearance of a herd; but I fancy the several families of these animals had only been brought together for the sake of the young green grass. In Southern Africa the white rhinoceros lived entirely on grass, and I have never seen any evidence of their having eaten anything else. When either walking, trotting, or galloping, the white rhinoceros always carried its nose close to the ground. A calf always preceded its mother, and she appeared to guide it by holding the point of her horn on the little creature's rump; and in all changes of pace, no matter how sudden, this position was always maintained. The white rhinoceros was easily killed by a shot through the heart or through both lungs, but would travel very long distances, and probably, as a rule, ultimately recover from wounds in other parts of the body. They could travel at a great rate and for a considerable distance with a broken fore leg or shoulder, but if a hind leg were broken they were rendered almost immediately helpless. In disposition they were sluggish and inoffensive animals, lying asleep in the shade of trees or bushes during the heat of the day, and coming to the water to drink at night or often before sundown in parts of the country where they had not been much molested. When disturbed, white rhinoceroses would go off at a swift trot, but if chased on horseback would break into a gallop, which they were capable of maintaining for a considerable distance, and at a wonderful pace for so large and heavy an animal. The meat of the white rhinoceros was most excellent, the part in greatest favour amongst hunters being the hump on the back of the neck in front of the shoulder, which was cut off whole and roasted in the skin in a hole dug in the ground.

The colour of the so-called white rhinoceros is dark gray. The second species of African rhinoceros, which is also dark gray in colour, is known as the BLACK or PREHENSILE-LIPPED RHINOCEROS.

they are too few in number to restock the country. They have a better chance, I think, of increasing in numbers in Zululand than in Mashonaland, in which latter country it is at present impossible to afford them any protection either from natives or Europeans.

A full-grown bull white rhinoceros stands from 6 feet 6 inches to 6 feet 9 inches at the shoulder, and is very massively built, with short, stout legs. The head is very much elongated, and the mouth square, like that of an ox. When white rhinoceroses were still plentiful, very considerable differences were observable in the length and shape of their horns. The anterior horns of full-grown bulls

Less than a hundred years ago the range of this fast-disappearing species extended from the northwestern districts of the Cape Colony to Abyssinia, and at that time it must have been plentiful over almost the whole of the intervening country. It never seems to have penetrated into the equatorial forest regions of West Central Africa, where the climate is probably too damp to suit its requirements; for both species of African rhinoceros appear to like a dry climate, and not to object to very arid surroundings. At the same time they never wander many miles from a river or pool, and drink regularly every night, and in hot weather probably very often a second time in the early morning.

In Southern Africa the black rhinoceros appears to attain to a larger size than in the countries farther north. To the south of the Zambesi large bulls of this species will stand 5 feet 8 inches at the shoulder; whilst the height of an adult bull, as taken by Mr. F. Jackson at Naivasha, in East Africa, was 5 feet 5 inches; and Mr. A. H. Neumann gives the standing height of another adult bull shot by himself still farther north, near Lake Rudolph, as only 4 feet 9 inches

It is now generally recognised that there is but one species of prehensile-lipped rhinoceros in Africa, though the horns, and especially the hinder one, differ in length and shape to such an extent that it was long thought that there were at least two distinct species, those with both horns of equal or nearly equal length having been distinguished from the more common form, with a comparatively short second horn, as the KEITLOA, this being the name in the Sechuana dialect for a prehensile-lipped

rhinoceros with horns of equal length. Speaking on this subject, Mr. A. H. Neumann, who has had great experience with the black rhinoceros in East Africa, writes: "Length of horn is a purely fortuitous individual trait; and the extremely long horns (mostly of females) which have occasionally been obtained from traders on the east coast, and brought home, are merely exceptionally fine specimens, selected from among large numbers brought to the coast (the bulk of which, I am told, go to China to be ground up into medicine), and do not belong to any distinct species, nor come from any particular region. In proof of this contention I may mention that I have a 40-inch horn, the owner of which I myself shot at the northern base of the Jambeni Range (near Kenia), in a neighbourhood where I hunted a great deal and saw great numbers of rhinos, and shot a good many. The vast majority have quite short horns—under a foot—and anything over 18 inches is uncommon, while a length of 30 inches or upwards is extremely rare." The black rhinoceros, I believe, never eats grass, but browses on the young shoots of trees and bushes, which are often quite leafless and seem excessively dry. In this way it chews up and swallows great quantities of dry-looking twigs, much of which passes through its stomach undigested.



Photo by Norman B. Smith, Esq.

BLACK AFRICAN RHINOCEROS

This photograph, taken by a sportsman in Africa, shows a charging rhinoceros just before it was shot



Photo by York & Son]

[Notting Hill

SUMATRAN RHINOCEROS

This species of rhinoceros is the smallest of the three Oriental forms. It has two horns

There has been a good deal of controversy as to the character and disposition of the black rhinoceros, some hunters and travelers regarding it as most dangerous and aggressive, whilst others are inclined to take an almost opposite view. That some black rhinoceroses are certainly aggressive and therefore dangerous animals, the experiences of C. J. Anderson and W. Cotton Oswell in South Africa many years ago, and of many travelers and hunters in East Africa during the last few years, certainly prove beyond a doubt; and as one never knows that any particular rhinoceros, when encountered, may not prove to be a vicious brute, a certain amount of caution should be employed in approaching one of these animals. In my own experience I always found that black rhinoceroses ran off at once on getting the wind of a human being; whilst, on the other hand, if they only heard one approaching, they would come towards the noise, and I have often known them to trot up to within twenty yards of where I was standing,

snorting and puffing loudly; but as these animals always turned round and went off eventually without charging, I came to the conclusion that they were inquisitive and very short-sighted rather than vicious. When fired into, a black rhinoceros goes off at a gallop—his usual pace, when alarmed, being a very fast trot—puffing and snorting loudly. He can gallop at a very great pace, considering his size and weight; but a South African shooting-pony can easily come up with him, or get away from him if pursued. In death a black rhinoceros will often sink down on its knees, and remain in that position, looking as if it were simply resting. When dying, it often gives vent to a pitiful squeal, the sound seeming very small and thin for so large a beast. The meat of the black rhinoceros is not ill-flavoured, and, if fat, very palatable; but as a rule these animals are very lean, and their flesh tough and coarse. The tongue, however, if well cooked, is always good; and the liver if first roasted under the ashes, and then, after being beaten up in a native wooden mortar, cooked with rice and fat, makes a dish which is good enough for a hungry man.

During the making of the Uganda Railway the engineers came upon something like a preserve of this species of rhinoceros, especially in the thick and waterless thorn jungle near the coast. The rhinoceros was almost the only animal, except the lion, which was able to penetrate the bush. As many as five of these animals were seen in one day when the line was being made; they did no injury to the coolies, other than by frightening them, and appeared to be stupid and by no means vigilant animals, perhaps because no other creature attacked them. The lion never meddles with a grown-up rhinoceros, though it might and probably does kill a calf occasionally, when the latter is no larger than a full-grown pig. The horns of some of these East African black rhinoceroses were of unusual length and thinness.

CHAPTER XII.

THE HORSE TRIBE.

ZEBRAS AND WILD ASSES.

BY F. C. SELOUS.

ZEBRAS.

THE ZEBRAS have many points in common with the asses, from which latter group of animals they are principally distinguished by their beautifully striped skins. Both asses and zebras carry short, erect manes, and in both the upper portion of the tail is free from long hair. In both groups there are naked callosities on the fore legs only, whilst the head is larger in proportion to the size of the animal, and the ears longer than in the horse. In BURCHELL'S and GREVY'S ZEBRAS the hoof is intermediate between that of the horse and the ass ; for although narrower than the hoof of the horse, it is broader and more rounded than that of the ass. In the TRUE ZEBRA, however, the hoof is thoroughly asinine in character, and the ears very long.

The TRUE or MOUNTAIN ZEBRA appears never to have had a very extended range. It was once an inhabitant of all the mountainous regions of the Cape Colony as well as of the great Drakensberg Range, and fifty years ago was also found amongst the rugged hills of Great Namaqualand. The mountain-zebra is the smallest of the group, standing only from 12 to 12½ hands at the shoulder. It is a most beautiful animal, the whole of the head, body, and limbs, with the exception of the under-parts and the insides of the thighs, being striped. The ground-colour of the body is white, the stripes



Photo by G. W. Wilson & Co., Ltd.

MOUNTAIN-ZEBRA

The true or mountain zebra is now becoming scarcer than formerly. At one time it was to be seen in great numbers on the mountains of Cape Colony



Photo by W. P. Dando

GREVY'S ZEBRA

This species of zebra come from the Galla country, and has narrower and more numerous stripes than the mountain-zebra

confined its range entirely to mountainous districts. Speaking on this point, Captain (afterwards Sir) Cornwallis Harris wrote upwards of sixty years ago: "This beautiful and wary animal never of its own free will descends into the plain, as erroneously asserted by all naturalists, and it therefore never herds with either of its congeners, the quagga and Burchell's zebra, whose habitat is equally limited to the open and level lowlands. Seeking the wildest and most sequestered spots, the haughty troops are exceedingly difficult of approach, as well on account of their watchful habits and extreme agility and fleetness of foot, as from the abrupt and inaccessible nature of their highland abode."

An allied species, of which examples have been obtained by Mr. G. W. Penrice, occurs in Benguela, Portuguese West Africa.

I once saw the carcase of a zebra stallion which had been sent by rail to the Cape Town Museum by a farmer living in the neighbourhood of the village of Worcester. This animal had come down from the mountains, and joined a troop of donkeys running on the farm. Its intrusion was, however, resented by a male donkey, which fought with and overpowered it, and, having seized it with its teeth by the back of the neck, held it fast until it was secured by the farmer and his men. The captured animal, however, refused food, and soon died, when its carcase was sent to the Cape Museum for preservation.

GREVY'S ZEBRA is the largest and perhaps the handsomest of all the zebras. This fine animal is an inhabitant of Eastern Africa, its range extending from the central portion of Somaliland southwards to the Tana River. It appears to be plentiful in the country between Mount Kenia and Lake Rudolph, but has not, I believe, been met with to the west of that lake. Full-grown specimens of Grevy's zebra will stand from $14\frac{1}{2}$ to 15 hands at the shoulder, with a girth of body immediately behind the shoulders of nearly 5 feet. The arrangement of the stripes in this species differs considerably both from that of the mountain-zebra of the Cape Colony and also from Burchell's zebra. The body-stripes are very narrow, numerous, and deep black in colour, and are separated by equally narrow white bands. The longitudinal stripes on the haunches are also shorter and finer than in any other species of zebra, and on the top of the centre of the back from the neck to the tail. The belly and insides of the thighs are white, and the legs banded right down to the hoofs as in the mountain-zebra, and the ears are as large as in that species,

being black and the muzzle bright brown. Both hind and fore legs are banded down to the hoofs. The stripes on the neck and body are narrower and more numerous than in Burchell's zebra, and on the hindquarters the median stripe, which runs down the centre of the back from the mane to the tail, is connected with the uppermost of the oblique longitudinal stripes by a series of short horizontal bars. The ears in this species are much larger than in Burchell's zebra.

The true zebra seems never to have been an inhabitant of the plains, like all its congeners, but to have



Photo by Percy Ashenden

BURCHELL'S ZEBRA AT HOME

This excellent photograph was taken in South Africa, and shows these animals in their native state

Grevy's zebra is, as a rule, an inhabitant of open or thinly wooded country, and it appears to avoid anything in the nature of thick cover. In Central Somaliland Major Swayne met with it on low plateaux some 2,500 feet above sea-level, the sides of which fell in broken ravines to the river-valleys. This country is described as broken and hilly, and here Grevy's zebras were met with in small droves of about half a dozen. In the country between Mount Kenia and Lake Rudolph, Mr. A. H. Neumann frequently met with herds of Grevy's and Burchell's zebras consorting together. The contrast between the two species when thus seen side by side was very marked, the former animals looking like horses among a flock of ponies. Mr. Neumann never observed stallions of the two species fighting together, but on the other hand he states that the stallions of the larger species fight viciously amongst themselves for possession of the mares. Grevy's zebras seem never to collect in large herds, more than twenty, or at the outside thirty, being very seldom seen together.

Although this species is an inhabitant of arid plains and bare stony hills where the herbage

is short, it requires to drink daily, and is never therefore found at any great distance from water.

The cry of Grevy's zebra is stated to be quite different from that of Burchell's. Mr. Neumann describes it as a very hoarse kind of grunt, varied by something approaching to a whistle, the grunts being long drawn out, and divided by the shrill whistling sound, as if the latter were made by drawing in the breath which had been expelled during the sustained grunt.



Photo by J. T. Newman]

[Berkhamsted

THE HON. WALTER ROTHSCHILD'S TEAM OF ZEBRAS

Mr. Rothschild was practically the first person to break in zebras to harness. At one time these animals were thought to be quite untamable

Like all other species of the genus to which they belong, Grevy's zebras, especially the mares when in foal, become very fat at certain seasons of the year, and their flesh is much appreciated both by natives and lions, the latter preying on them and their smaller congeners, Burchell's zebras, in preference to any other animal, now that the rinderpest has almost exterminated the great herds of buffalo which once roamed in countless numbers all over East Central Africa.

BURCHELL'S ZEBRA once inhabited the whole of Southwestern, Southeastern, Central, and Eastern Africa from the Orange River to Lake Rudolph; and though it has long ceased to exist in the more southerly portions of its range, it is still the most numerous and the best known of all the species of zebra.

The typical form of this species was first met with early last century by Dr. Burchell in Southern Bechuanaland. In this form the legs are white below the knees and hocks, and the body-stripes do not join the median stripe of the belly. In examples met with farther north the legs are striped down to the hoofs and the body-stripes join the belly-stripe. South of

the Zambesi all forms of Burchell's zebra seem to have faint markings, known as shadow-stripes, on the pale yellow ground-colour of the spaces between the broad black stripes. North of the Zambesi varieties are met with in which these shadow-stripes are wanting. As, however, the differences between all the various sub-species of Burchell's zebra are superficial and not structural, and as, moreover, the habits of these animals seem to be the same in every part of their widely extended range, I shall henceforth speak of them as one species.

Burchell's zebra is without the small horizontal bars on the hindquarters, which in the mountain-zebra connect the dorsal stripe with the uppermost of the broad longitudinal bands running across the flanks. Its ears, too, are smaller than in the latter species, and its mane fuller. In size Burchell's zebra is intermediate between the mountain-zebra and Grevy's zebra, standing from thirteen to thirteen and a half hands at the shoulder.



By permission of Mr. William Cross

BURCHELL'S ZEBRA, CHAPMAN'S VARIETY

Where they have not been shot down, Burchell's zebras often live in large herds of from fifty to over a hundred together. I have met with them almost at the level of the sea, as in the Pungwe district of South-east Africa, and all over the high plateaux of the interior up to a height of 5,000 feet above sea-level. They are partial to sparsely forested country intersected by open glades, but also frequent open plains entirely devoid of trees or bush, having been once numerous on the open downs of the Western Transvaal and Orange River Colony. They never live in dense jungle, but I have met with them frequently amongst broken rugged hills. Burchell's zebras are both fleet and enduring, but I have often galloped right amongst a herd of them when mounted on a fast horse, and in good ground. In broken, hilly, and stony ground, however, no horse can live with a Burchell's zebra. The hoofs of this species seem made for running in rocky ground, being deeply hollowed and as hard as iron.

I have always found the presence of Burchell's zebras a sure indication that water was not



MARE AND FOAL OF BURCHELL'S ZEBRA

These animals breed regularly in captivity

species are easily caught, and become at once very tame and confiding; nor do I believe that adult Burchell's zebras are such vicious animals as is generally supposed, since I have seen several which were very quiet and well broken, whilst even the half-broken animals, which were at one time used on one of the coach-lines in the Transvaal, did not appear very vicious.

As with Grevy's zebra, the flesh of the species under consideration is much appreciated both by natives and lions. I have often seen the fat on the quarters of the mares quite an inch thick. It is of a dark yellow colour, and too rich to suit the stomach of a European. The meat is rather sweet in taste, but if fried with bacon not at all unpalatable.

Professor Ewart has lately carried out a very interesting series of experiments on the hybridising of zebras and horses. The results were very satisfactory. The zebra cross proved to be very hardy creatures, capable of wintering in the open on the hills of Scotland. The scientific data obtained were of singular value, as showing the effect of crossbreeding on subsequent generations of foals of the same mother. It has long been believed that the influence of the first sire was seen in foals of which other animals were subsequently the fathers. Thus, if a white mare threw a foal to a black stallion, it was considered that her subsequent progeny would occasionally be black, and instances were freely quoted to support this theory. The scientific name of "telegony" was given to this supposed influence of previous sires on future offspring. Professor Ewart's experiments, in which pony mares were first mated with a zebra and afterwards with horses, show that this theory of telegony is erroneous. The foals sired afterwards by ponies and horses showed no trace whatever of zebra stripes, but were normal pony foals, and not altered either in shape or disposition.

far distant, and it is my experience that these animals require to drink daily, and never wander more than a few miles away from the pool or river they frequent.

This species of zebra may often be seen in Southern Africa in company with other animals, such as buffaloes, blue wildebeests, elands, gemsbucks, roan and sassaby antelopes, and ostriches, and I have upon several occasions seen them come up to domestic cattle and horses. They are naturally not very wary, and in parts of the country where they have not been much molested are often very inquisitive, and will come trotting quite close up to a caravan, provided they do not get the scent of human beings. Foals of this



Photo by Norman B. Smith, Esq.

BURCHELL'S ZEBRA

This species is occasionally domesticated and driven in South Africa, as it is not injured by the tsetse fly

The QUAGGA, which became extinct about thirty years ago, never had a very extended range, but in the early part of the last century it existed in great numbers on all the upland plains of the Cape Colony to the west of the Kei River, and in the open treeless country lying between the Orange and Vaal Rivers. North of the Vaal it appears to have been unknown.

The quagga seems to have been nearly allied to Burchell's zebra—especially to the most southerly form of that species—but was much darker in general colour, being of a dark rufous brown on the neck and upper-parts of the body, becoming lighter on the sides, and fading off to white beneath and behind.

Instead of being striped, too, over the whole body, it was only strongly banded on the head and neck, the dark brown stripes becoming fainter on the shoulders and dying away in spots and blotches. On the other hand, in size and build, in the appearance of its mane, ears, and tail, and in general habits, it seems to have nearly resembled its handsomer relative. The barking neigh "quā-hā-hā, quā-hā-hā" seems, too, to have been the same in both species. The word "quagga" is pronounced in South Africa "quā-hā," and is of Hottentot origin, being an imitation of the animal's neighing call. To-day Burchell's zebras are invariably called Quā-hās by both Boers and British colonists.



Photo by Percy Ashenden

ZEBRAS ON TABLE MOUNTAIN

Another South African photograph. Notice Cape Town in the far distance

WILD ASSES

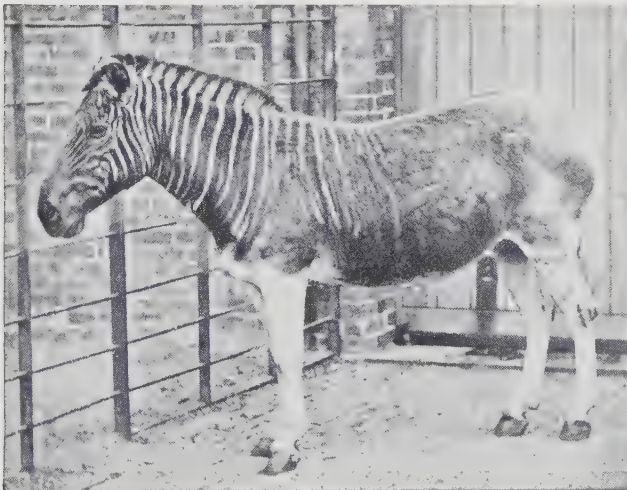


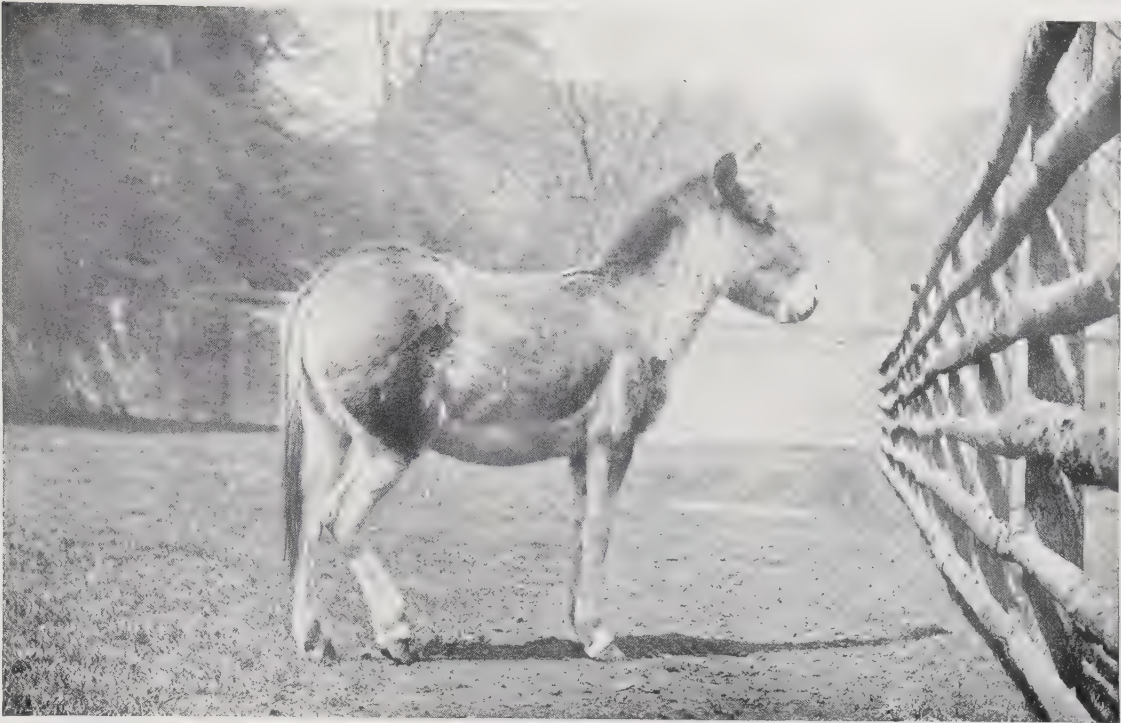
Photo by York & Son

QUAGGA

This is, we believe, the only known photograph from life of this very rare animal. There will probably never be another, for the quagga is generally supposed to be extinct

The true asses are without stripes on the head, neck, and body, with the exception of a dark streak down the back from the mane to the tail, which is present in all members of the group, and in some cases a dark band across the shoulders and irregular markings on the legs.

In Africa the wild ass is only found in the desert regions of the north-eastern portion of that continent, being an inhabitant of Abyssinia, Somaliland, Gallaland, the Soudan, and the arid districts bordering the Red Sea. The form of wild ass found in Somaliland differs in some respects from its near relative of the Nubian Desert, in that it is of a paler colour, has the dorsal stripe but faintly marked, and is without a cross stripe over the shoulders,



MALE KIANG

The kiang comes from the Tibetan highlands. It is the largest and most horse-like of the wild asses of Asia

range, but of woody plants on the high mountain-plateaux, where little else is to be obtained. Of wild asses in general the late Sir Samuel Baker once said: "Those who have seen donkeys only in their civilised state can have no conception of the wild or original animal; it is the perfection of activity and courage."

DOMESTICATED HORSE, ASSES, AND MULES

BY W. P. PYCRAFT, A.L.S., F.Z.S

THE DOMESTICATED HORSE

LIKE the wild camels, genuine wild horses are very generally believed to be extinct. The vast herds which occur to-day in a wild state in Europe, America, and Australia are to be regarded, say those who believe in the extinction theory, as descended from domesticated animals which have run wild. So far as the American and Australian horses are concerned, this is no doubt true; but of the European stocks it is by no means so certain. For Dr. Nehring—and he speaks with authority—assures us that the wild horses known as TARPANS, which occur on the steppes north of the Sea of Azoff, between the river Dnieper and the Caspian, are veritable wild horses, the last remaining members of enormous herds which occurred in Europe before the dawn of civilisation. These horses formed no small part of the food of the savage races of men then inhabiting this continent. This we know because of the quantities of their remains found in the caves of the south of France, for instance, associated with the remains of the men who hunted them. Further evidence of this we have in the shape of crude engravings on pieces of bone and deer horns, carved by the more artistic spirits amongst these early hunters. From these drawings we gather that the horse they hunted was small in size and heavy in build, with a large head and rough, shaggy mane and

tail—a horse, in fact, almost identical with the above-mentioned tarpan. But long before historic records begin these horses must have been domesticated; man discovered that they could be even more useful alive than dead, and from that time forth the horse became his inseparable companion. “Cæsar found the Ancient Britons and Germans using war-chariots drawn by horses.”

But the stock of domestic horses drawn from this tarpan breed appears to have died out almost entirely, the majority of horses now existing being probably descendants of the native wild horses of Asia, the product of a still earlier domestication. In Egypt the horse, as a domestic animal, seems to have been preceded by the ass; but about 1900 B.C. it begins to appear in the rôle of a war-horse, to draw chariots. Its use, indeed, until the Middle Ages was almost universally as a war-horse.

From the time of its domestication till to-day the history of the horse has been one of progress. The care and forethought of the breeder have produced many varieties, resulting in such extremes as the London Dray-horse, the Racer, and the Shetland Pony.

The coloration of our various breeds of horses is generally without any definite marking, piebald and dappled being the nearest approach to a pattern. Occasionally, however, horses are



Photo by T. Fall

YEARLING ARAB COLTS

Note the colts examining the photographer's bag. They are very inquisitive creatures, but easily frightened

found with a dark stripe along the back, and sometimes with dark stripes on the shoulders and legs. Darwin, discovering a number of horses so marked belonging to different breeds, came to the conclusion that probably all existing races of horses were descended from a “single dun-coloured, more or less striped primitive stock, to which [stock] our horses occasionally revert.”

“If we were not so habituated to the sight of the horse,” says the late Sir William Flower, “as hardly ever to consider its structure, we should greatly marvel at being told of a mammal so strangely constructed that it had but a single toe on each extremity, on the end of the nail of which it walked or galloped. Such a conformation is without parallel in the vertebrate series.” By the aid of fossils we can trace out all the stages through which this wonderful foot has passed in arriving at its present state of perfection: we can see how it has become more and more beautifully adapted to fulfil the requirement demanded—a firm support to enable its owner to cover hard ground at great speed. The study of the structure of this foot, and a comparison with the intermediate forms, make it clear that this toe corresponds to the third finger or toe of the human hand or foot—according as we compare the fore or hind limbs—and that its development was at the expense of the remaining toes, which gradually dwindled and disappeared, leaving in the living one-toed horse only traces of the second and fourth toes in the shape of a pair of splint-bones, one on either side of the excessively developed third toe.

The horses, it must be remarked, may be distinguished from the asses by the fact that the tail in the former is clothed with long hair throughout; in the latter long hair springs only from the sides and end, forming a tuft. Furthermore, the horses have a remarkable horny



Photo by T. Fall

ARAB MARE

Nothing would induce this horse to stand still in order to be photographed; so as a last resource the rider put on her Arab costume. This acted like magic, for under its spell the animal at once became quiet



Photo by T. Fall

ARAB MARES AND FOALS

excrescence, resembling a huge black and flattened wart, on each hind leg just below the "hock," or heel-joint. This excrescence is commonly known as the "chestnut." Its function is unknown. A similar pair of "chestnuts" occurs on the inner side of the fore limb just above the wrist, or "knee," as it is generally called. The "chestnuts" of the fore limb occur also in the asses, but not those of the hind limb.

THE ARAB HORSE

This magnificent and justly celebrated animal is chosen first for consideration because it is probably a direct descendant of an original wild breed—the Asiatic wild horse. How far back the domestication of this breed began will probably never be exactly known. Till the third century after Christ the Arabs were almost certainly camel-riders; but by the sixth century of our era we find them in possession of a breed of horses which they regarded with great reverence, and spoke of as an heritage from their forefathers. They were probably introduced from the Caucasus or Asia Minor. The Arab horse found its way into Europe, perhaps accompanied by an allied breed—the Barb—with the Arab invasion of Spain in the eighth and ninth centuries, leaving traces of its sojourn in the Andalusian and the French Limousin. But the great value of Arab blood was not appreciated till armour ceased to be used, the excessive weight of this demanding a horse of heavy build.

The Arab does not appear to have been introduced into England till the seventeenth century; but the result of that introduction, as we shall see presently, has been fraught with tremendous consequences. In its native land it appears to have been bred chiefly for the purposes of warfare. The success with which the breeders' judicious selection has been rewarded is plainly seen in the wonderful powers of endurance on long marches; so that, at the end of a raid, the animal is still fresh enough either for flight, if necessary, or for a final rush on a retreating enemy. Besides, Arabs possess great courage, and are frugal both in the matter of food and drink.

As a race-horse, one enthusiast assures us, the Arab is superior to every other natural breed; he is beaten only by his own half-breed offspring—the English Race-horse. But this seems to be rather an over-estimate.

The colour of the Arab varies; white is the most highly esteemed, but bay and chestnut are common, black being rare. Strange as it may seem, the white breed is never born white.

The great affection of the Arab for his horse is proverbial. The following story is certainly worth repeating: "The whole stock of an Arab of the desert consisted of a mare. The French Consul offered to purchase her, in order to send her to his sovereign, Louis XIV. The Arab would have rejected the proposal; but being miserably poor, with scarcely a rag to cover him, his wife and children starving, he was tempted greatly. At length he yielded. He brought the mare to the consul's house, and stood leaning on her neck,



PERCHERON HORSE

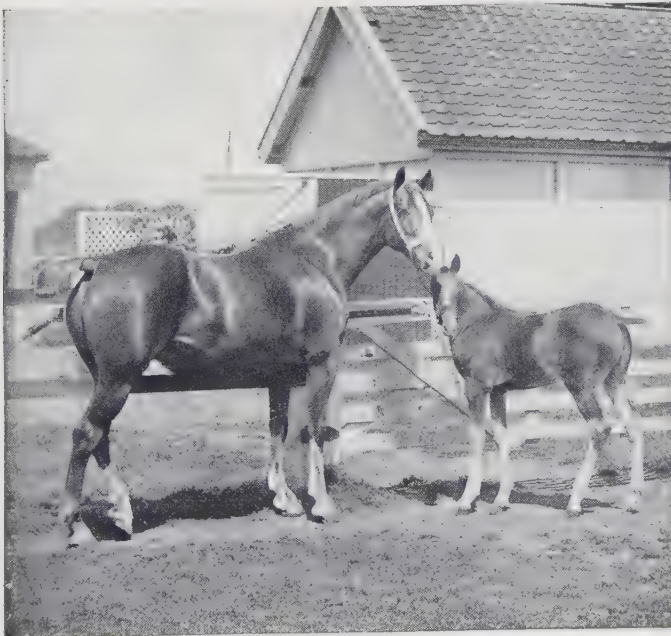


Photo by T. Fall

HACKNEY AND FOAL

A specimen of the English carriage-horse

and looking, now at the gold, and now at the horse. The gold was good to look upon; it would make him rich for life. Turning at last to his favourite, he said: 'To whom is it I am going to yield thee up? To Europeans, who will tie thee close, who will beat thee, who will make thee miserable. Return with me, my beauty, my jewel, and rejoice the hearts of my children.' At the last of these words he sprang upon her back, and was in a few moments out of sight."

THE BARB

This is an African breed, which, like the generality of African horses, is distinguished from those of Asia by its long limbs and small girth at the loins, thus resembling the foals of other breeds. It displays great powers of enduring hunger and



Photo by C. Reid

LADAS

A perfect English thoroughbred. With this racer Lord Rosebery won the Derby in 1894

been built up, by the infusion of Arab blood, the swiftest horse which the world has ever known—the BRITISH THOROUGHBRED. “Of this breed, it may be stated,” says Mr. Allison, “that every such animal in the stud-book of the present day, in this country or any other, descends . . . from one of three original Eastern sires—the Darley Arabian, the Byerley Turk, or the Godolphin Arabian.” This is an extremely interesting fact, and constitutes a lasting monument to the enterprise and acumen of the British horse-breeder.

The Byerley Turk hailed from the Levant, and was introduced by Captain Byerley about 1689. From the Byerley Turk came Herod, the most celebrated of his descendants, who has given rise to the Herod line, which to-day is but feebly represented.

The Godolphin Arabian, or the Godolphin Barb, was born about 1724. From his grandson Matchem is derived the Matchem line, which is also to-day bordering on extinction.

The Darley Arabian carries us back to the reign of Queen Anne. Flying Childers and Bartlett's Childers are directly descended from him; and from the latter is descended Eclipse, the fastest horse which the turf has ever known. It is interesting to note that the descendants in the Eclipse line enormously outnumber those of the other two lines which we have considered. Of his descendants, one of the

thirst; and is fleet, with a high and graceful action. The barb takes its name from its native land—Barbary. It is a larger breed than the Arab.

LEVANT AND PERSIAN HORSES

These are very closely allied to the Arab, but generally of larger size; and in Southern Persia, at least, less delicately framed. The Turkoman horses are related to those of Northern Persia.

THE ENGLISH RACE-HORSE

This animal is the product of very careful selection and gradual improvement of an original native breed, extending over several centuries. Long since, so long ago as the reign of James I., it had reached a high degree of excellence.

Upon this native stock there has



Photo by C. Reid

FLORIZEL II

One of King Edward's racing-stud

most illustrious is Stockwell, who has been described as the most extraordinary sire of all time, whose blood is coming more than ever to the front.

THE TROTTING-HORSE

This is an American breed. The trotting-horse is a combination of barb and Arab on an English stock. Most of the trotting- and pacing-horses of America may be traced to an English thoroughbred — Messenger — who was imported into America in 1780. This horse became the founder of the greatest trotting family in the world. The speed attained by some of the fastest trotters is wonderful, a mile being covered in some three or four seconds over two minutes.

Russia is the only European country with a distinct breed of trotter—the ORLOFF. This breed was made by crossing Arab and English horses with the native races. The Orloff

has not the speed of the American horse, but has greater powers of endurance. The trotting-season in Russia is winter, the races taking place on the ice.

The PACER is not a distinct breed, but so called on account of its curious method of trotting. In trotting the left fore and right hind leg strike the ground at the same moment; in pacing the fore and hind leg of the *same side* move in unison. Some wild animals — as the giraffe — are pacers. "Many American horses," says Mr. Winans, "are able to move with either action, a set of lighter shoes often sufficing to convert a trotter into a pacer." Pacing is a swifter mode of motion than trotting.

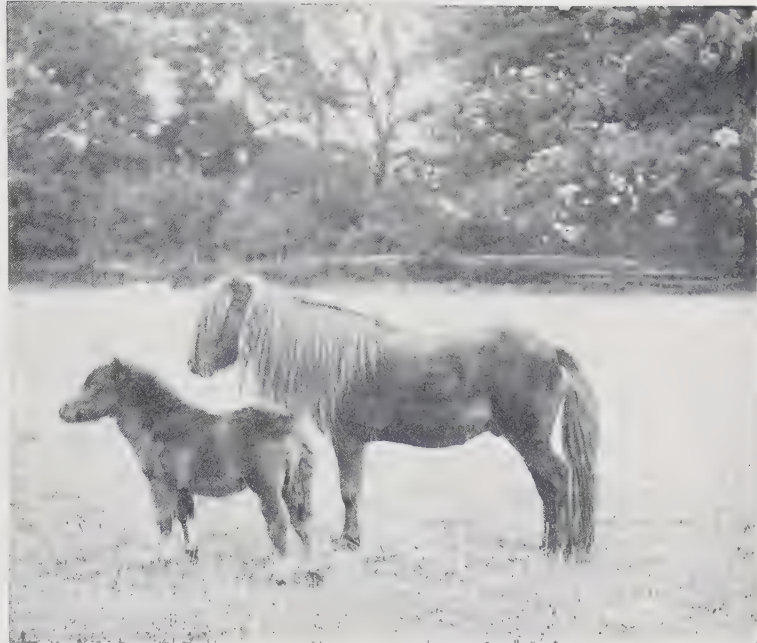


Photo by T. Fall

SHETLAND PONY AND FOAL

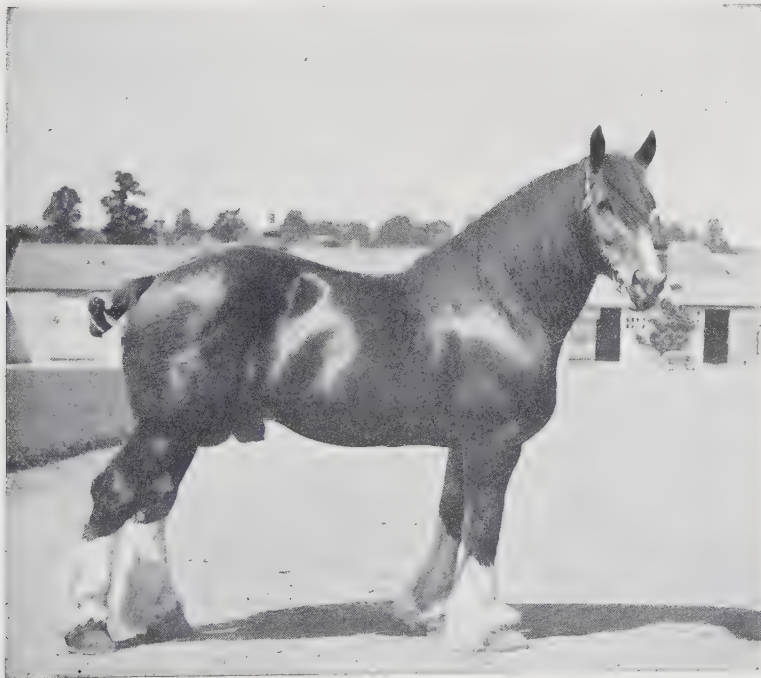


Photo by T. Fall

CHAMPION SHIRE STALLION

A celebrated cart horse



SHIRE MARE AND FOAL



Photo by T. Fall

WELSH PONY

This photograph shows the Duchess of Newcastle with one of her white Welsh ponies

The pacing record time stands at one mile in 1 minute 59½ seconds, as against the trotting record of one mile in 2 minutes 3¼ seconds.

THE HUNTER

This also is not a distinct breed, as some suppose. Any good riding-horse may be used as a hunter. "Hunters" have been made by infusing the blood of the race-horse with native breeds. The chief requirements are a muscular neck and chest, with a rather short body, and shorter and stouter legs than the race-horse.

From the half-bred hunter we pass by insensible gradation to the ordinary saddle- and carriage-horses. The ideal carriage-horse, however, is more of a distinct breed than the hunter, and known as the CLEVELAND BAY. It has been produced by mingling the blood of the thoroughbred with that of a horse of stouter make than that of the hunter type.

The record broad jump for the hunter, we might mention in passing, is variously stated to be from 33 to 37 feet!

THE SHETLAND PONY



Photo by T. Fall

DONKEY

A Typical Coster's Donkey



Photo by C. Reid

POLO-PONY

Various breeds of ponies are used in this game, but the most esteemed at the present day are the English-bred New Forest, Dartmoor, or Exmoor, or Welsh ponies.

This is a native of the Shetland Islands, and remarkable for its small size, docility, and hardihood. It is allowed to run nearly wild, and made to forage almost entirely for itself. In the winter it grows a coat of great length, which, soon becoming matted, forms a most effective protection against cold and wet. The DARTMOOR, EXMOOR, and NEW FOREST are likewise small breeds, but lack the symmetry and beauty of the Shetland.

CART-HORSES

Under this head are included all the large, heavily built draught-horses. These are of European origin, and without intermixture of foreign — Asiatic or African — blood. In England the most important breeds are the BLACK or SHIRE HORSE, the CLYDESDALE, and the SUFFOLK PUNCH. These are wonderful instances of the results of selective breeding.



Photo by W. Reid

EGYPTIAN DONKEYS

The ass has long been known to the Egyptians, having been in use by them before the introduction of the horse

towards a definite end — large size, accompanied by great physical strength and powers of endurance. To accomplish this, speed has had to be sacrificed.

ASSES AND MULES

ASSES

THE DOMESTIC ASS, so common to-day in these islands, is of African origin, and has, moreover, departed but little in either form or colour from the wild race. This is probably due to the fact that the ass has not been subjected in this country to that process of rigorous and careful selection that the horse has undergone.

We have no record of its first introduction to England, but it was certainly known in the reign of Ethelred, though it was a rare animal. Later it appears to have died out, and to have been reintroduced in the reign of Elizabeth; but it has never become popular. This is unfortunate; its sterling qualities have never been really appreciated there. Spain, Italy, and Malta have all succeeded in raising some fine breeds. The United States has, however, produced the finest of all in animals standing some 15 or 16 hands (5 feet or 5 feet 4 inches) high.

MULES

The term MULE, strictly speaking, should be reserved for the offspring of the male ass and the mare: the offspring of the opposite cross is called the HINNY. Mules are valued on account of their great powers of endurance and their sure-footedness. The finest and handsomest are bred in Spain, the United States, and North-west India.

It is interesting to note that mules exhibit a strong tendency to revert to the dun-coloured and striped coloration believed to belong to the primitive horses. The spinal and shoulder stripes which sometimes appear in horses, and more frequently in asses, occur yet more frequently in mules. The legs of the mules appear particularly liable to revert to this striped coloration in the United States, it is said nine out of ten being so marked.

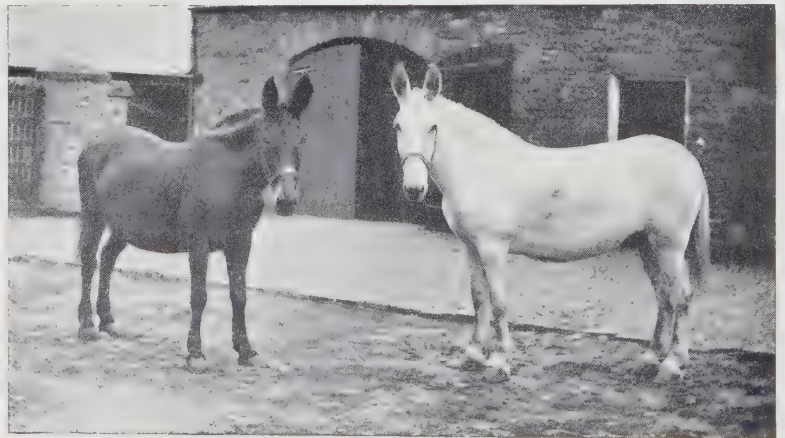


Photo by C. Reid

[Wishaw, N. B.]

MULES



Photo by Charles Reid, Wishaw, N. B.

HIGHLAND CATTLE

These magnificent cattle are bred in large numbers in the Scottish Highlands, whence they are brought to the richer pastures of England to fatten for the market.

CHAPTER XIII

THE HOLLOW HORNED RUMINANTS: OXEN, BISON BUFFALOES, AND MUSK-OX

CATTLE, Deer, Camels, Pigs, Horses, Tapirs, Rhinoceroses, and Elephants differ greatly in structure from the orders already described. They are classed as the Ungulates, or Hoofed Mammals. In most of these, such as the Horse, Deer, and Oxen, the toes are contained within a solid hoof; in others, such as the Rhinoceros, they are protected by broad nails. Great differences exist in the feet of the various groups of Ungulates, caused by the degree in which the digits, or "toes," remain in use or not. Except in the Elephant, where there are five, the greatest number of "working" digits found in existing forms is four. In the Horse and its surviving allies the digits are reduced to one; in the Giraffes, to two.

The general process, as it can be learnt from the remains of the horse-like animals of the past, seems to have been as follows. One or more of the toes were developed in length and strength at the expense of the others, until, in the case of the Horse, only one toe remained, which was enclosed in a large and solid hoof, little splints on either side of the cannon-bone being left to hint where the second and fourth toes had once been. In the Oxen and Deer the third and fourth toes developed equally, at the expense of the others, and each gained a case or covering, which makes the two parts of the "cloven hoof" of these groups.

The first group of the order of Ungulates is represented by the Hollow-horned Ruminants. These have horns set on a core of bone, the horns themselves being hollow throughout. They "chew the cud," after receiving the food eaten into the first of four divisions in the stomach, whence it is brought up into the mouth, and then swallowed again for digestion. The Oxen, Sheep, and Goats have no popular name by which they are collectively distinguished, but their characteristics are sufficiently well known. The horns are never shed annually, as is the case with the Deer; and the hoofs are cloven. They have no incisor teeth in the upper jaw, a characteristic also shared by the Giraffes, the Prongbuck (or American antelope), and the Deer. The lower jaw has its full complement of incisor teeth.

The Oxen and the allied Bison, Yak, and Buffaloes are the bulkiest and most important to man of all ruminants. Some are found in nearly all inhabited parts of the Old World, and there is one North American species, now practically exterminated as a wild animal.



Photo by E. Lander

ENGLISH PARK-CATTLE

This photograph represents two animals of different types. The bull is pure-bred; the cow is a cross-bred

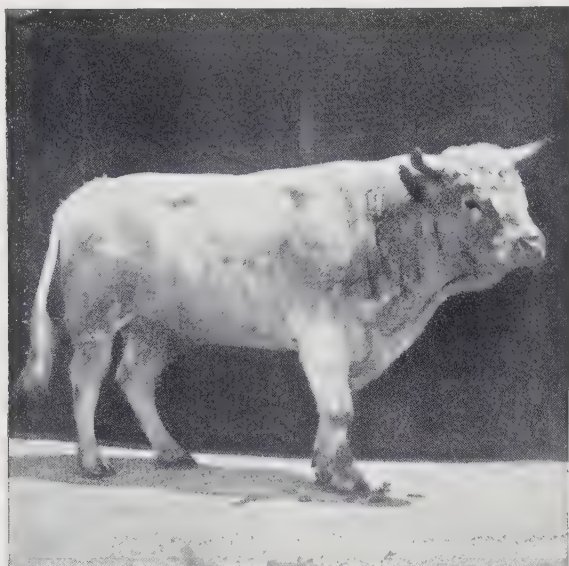


Photo by W. P. Dando

ENGLISH PARK BULL

The similarity in shape to the best-bred modern shorthorns is obvious

wild oxen, which still survived in the Black Forest in Cæsar's time, have been dug up in many parts of England, especially in the Thames Valley, and may be seen at the Natural History Museum. The remains of the extinct wild ox, the *Bos urus* of the Romans, show that, if not so large as an elephant, as Cæsar heard, its size was gigantic, reckoned by any modern cattle standard whatever. It probably stood 6 feet high at the shoulder, and there is every reason to believe that it was the progenitor of the modern race of domestic cattle in Europe. It seems certain that the Chartley Park herd did once run wild in Needwood Forest; but so do the Italian buffaloes in the Maremma, and the Spanish bulls on the plains of Andalusia. Those at Chartley have been kept in the park, which is very wild and remote, so long that they have gradually lost many of the attributes of domestication. This is even more marked in the case of Lord Tankerville's white cattle at Chillingham. An observant visitor to Chillingham lately noted that the bulls fight for the possession of the cows, and that one is occasionally killed in these combats. The cows still "stampede" with their calves when alarmed, and hide them for a week or ten days after they are born. The horns of the Chillingham cattle turn up; those of the bulls of the Chartley herd are straight or slightly inclined downwards. Cross-breeds between the Chartley cattle and some other herds of reputed ancient descent may generally be seen at the London Zoological Gardens. They remain remarkably true to type.

BRITISH PARK-CATTLE, AND THE AUROCHS

THE so-called "WILD CATTLE" found in the parks of Chillingham and Chartley, as well as in Lord Leigh's park at Lyme, and in that of the Duke of Hamilton at Cadzow Castle, Scotland, are probably not the descendants of an indigenous wild race. It is not without reluctance that the belief in their wild descent has been abandoned. But the evidence seems fairly conclusive as to the antiquity of these white cattle, regarded as a primitive breed, and of the unlikelihood of their being survivors of a truly wild stock. They are almost identical in many points with the best breeds of modern cattle, and probably represent the finest type possessed by the ancient inhabitants of these islands. But they are far smaller than the original WILD OX, or AUROCHS, the ancestor of our domestic breeds. The skulls of these large

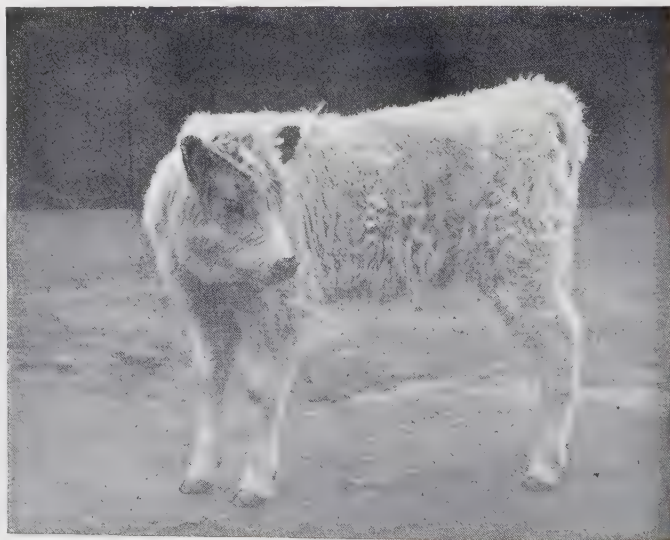


Photo by W. P. Dando

CALF OF ENGLISH PARK-CATTLE

Though the stock is very old and inbred, the white park-cattle are still fairly prolific

Formerly there were several other herds of ancient white cattle. One was at Gisburne, in Yorkshire; another at Chatelherault Park, in Lanarkshire; and records of herds at Bishop Auckland in Durham, Barnard Castle, Blair Athol, Burton Constable, Naworth Castle, and other ancient peaks are preserved. Probably all were of a breed highly prized in ancient days, which was allowed the run of the forests adjacent to the homes of their owners; then, as the forests were cleared, they were gradually taken up and enclosed in parks. Another theory is, that they were the white cattle of North-western



Photo by J. T. Newman

JERSEY COW

Though small in size, the Jersey cows produce more butter than any English breed

Italy, imported by the first settlements of Italian monks after the conversion of the Saxons.

SOME DOMESTICATED CATTLE

THE various species of European domestic cattle have in most cases been brought to a degree of excellence even higher than that which might be expected from the long period of time in which their improvement has been an object of solicitude to man. Of the foreign races, the dark red cattle of the Spanish Peninsula — animals which have been exported to the Canary Islands and Madeira with great success — are justly famous. The white oxen of North-east Italy have been famous since the days of the Romans. The tall long-horned cattle of Hungary are excellent alike as beasts of draught and for beef. The black-and-white Dutch cows are, and have been, the mainstay of the dairy industry of Holland, and later of Denmark; while the small Brittany cows are perhaps the best butter-producers on the continent of Europe. But England and the Channel Islands may justly claim to rear the finest cattle of the



Photo by W. P. Dando

SPANISH CATTLE

These belong to the long-horned race of Southern and Eastern Europe. In the bulls the horns are shorter, and often turn downwards

temperate parts of the world. The diminutive Jersey cows, now reared in all parts of the kingdom, surpass all the animals of Europe or America in the richness of their milk, while stock from the pedigree herds of various English breeds is eagerly sought by foreign and continental buyers on both sides of the Atlantic, and in New Zealand and Australia. These foreign strains need constant replenishing from the English herds, and the result is a golden harvest to the breeders in these islands.

The SHORTHORN was the first breed to be brought to perfection. Two main stocks — one for producing beef, the other for the dairy — are recognised; they are the "all-round breed" most in favour, and it is said that the improvement in this race alone has

raised the value of average Irish store cattle \$10 per head during the last twenty years. The shorthorns are level-backed, large animals, maturing very quickly. The commonest colours are roan, white, red, and red-and-white. HEREFORD CATTLE are red, with white faces and long, upturned horns; they fatten quickly on good grass, and are in most demand for summer beef. HIGHLAND CATTLE have long horns, rough, shaggy coats, and bodies of moderate size and great symmetry; they are grazed on the mountains of the West Highlands mainly, and fattened in the south. The beef is of the finest quality. SUSSEX CATTLE are an "all red" variety, large, and formerly much used for draught and farm work. The DEVONS are another red variety, very like the Sussex, yielding excellent and rich milk, and, when fattened, being little inferior to any breed as beef. The long-horned black WELSH CATTLE grow to a great size, as do the polled ANGUS breed of Scotland. The polled or hornless cattle include the red SUFFOLKS, a most valuable breed, hardy, and wonderful producers of milk. The cows often give milk every day of the year. The LONGHORN breed is almost disappearing, as the

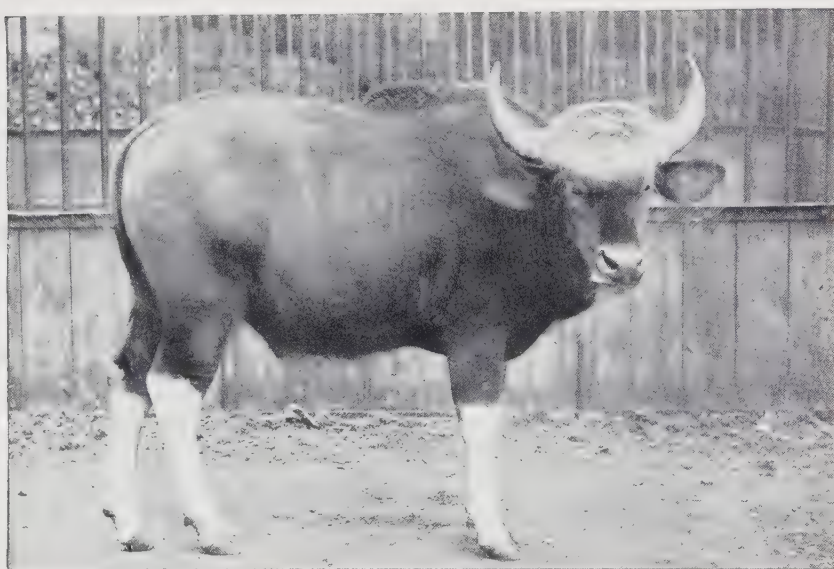


Photo by G. W. Wilson & Co., Ltd.

YOUNG GAUR

The largest and handsomest of the wild oxen

horns are a disadvantage both in the fields and when the animals are carried on board ship or in the train. The HUMPED CATTLE of India and East Africa belong to a race different from European cattle, of which the parent stock is not known. They have a hump upon the withers, drooping ears (a sign of ancient domestication), and a very large dewlap. The coat is always exquisitely fine. They are of all sizes, from the tall Brahminee bull to dwarf breeds not larger than a Newfoundland dog. The

commonest colours are cream, grey, mouse-colour, and white. They do not low, but grunt, and are by no means so fond of shade and water as European cattle.

WILD OXEN

THIS group consists of the GAUR of India; the GAYAL of Assam, which is possibly a domesticated form of the gaur, but rather smaller in size, with skull and horns different in character; and the BANTING, a lighter and more slender wild ox, of which different varieties are found in Burma, in Java (where it is kept in a half-domesticated condition), and in Manipur.

THE GAUR

The GAUR, the so-called INDIAN BISON, is probably the largest of all the wild bovine animals. It is found at the foot of the North-eastern Himalaya, in the Central Provinces of India, the forests of Madras and Mysore, and in parts of Burma and the Malay Peninsula, but not in Ceylon. Its range eastward is not accurately known. In habits the gaur is mainly a forest animal, retiring always at daybreak into the depths of the jungle. It sometimes attains a height of over 6 feet at the shoulder, and a length of 9 feet 6 inches

from the nose to the tail. The colour of the full-grown gaur is dark brown, turning to black; the legs from above the knees and hocks to the hoofs are white, the hair being short and fine. Its horns are upturned, and tipped with black, with white hair covering the junction on the top of the skull. The cows are much smaller than the bulls, standing about 5 feet high at the shoulder. This species feeds both on grass and on the young shoots of trees and of bamboos. The calves are dropped in August and September. The pure-bred animal does not appear capable of domestication.

Hunting gaur by tracking in the jungle has long been a favourite sport of Anglo-Indians. General Douglas Hamilton says: "I have killed bulls measuring 6 feet at the shoulder, and the average height of the male is from 5 feet 8 inches to 5 feet 10 inches. An old bull gaur is a magnificent animal. The normal colour is a brownish black, sometimes in very old specimens almost quite black. The white stockings reach from the hoof to above the knee, and are very conspicuous. When on the Anamalties, I had a grand fight with a big bull. I was out early, and came on the spoor of bison, and soon saw two, one a very large bull. To my disgust he lay down, and was completely covered by creepers and bushes. After a bit I attempted to move to get a better view; but there to my left was a cow bison staring at me. She at once gave the alarm, and I waited for the large bull to rise. This he did so quickly, and disappeared so suddenly, that I only got a snapshot. As I stopped to load, I saw a young calf squatting at the foot of a tree like a hare, intently watching me. I put the rifle down, crept up behind the tree, and suddenly threw myself on the little calf, and managed to get hold of its hind legs, but it got from under me. I managed, however, to tie its fore legs securely by means of some slender stems from the creepers. All this time it continued to bellow and to make a great row, and I fully expected to see the mother come charging down. I went back to the bungalow, and got some men to bring my little captive home. After breakfast I started again, and got on the track of the bison. . . . I saw some branches move, and on looking carefully perceived a large bull bison; but he was among the thick bushes, and I could not see his outline. I guessed as nearly as possible the position of the shoulder, and fired the big rifle at him. He gave a bound forward, and then stopped long enough for me to give him a shot with the other barrel. . . . The next moment I saw the bull standing on the high ground above us. I fired again, and hit him well behind the shoulder. He dashed off, but only went fifty yards, and then stopped. I walked up, thinking to finish him, when he made a fearful rush at me. My man put the double rifle into my hands and then bolted, and I thought it prudent to retire and await my opportunity. But he only moved a few paces forward, and then stopped. Then began a regular siege of his position." The result of the siege was that the bison received four more bullets, charged and routed the hunter twice, and then walked off. It was shot twice more, charged again, and was finally killed by General Hamilton with his hunting-knife tied to a bamboo spear-pole.

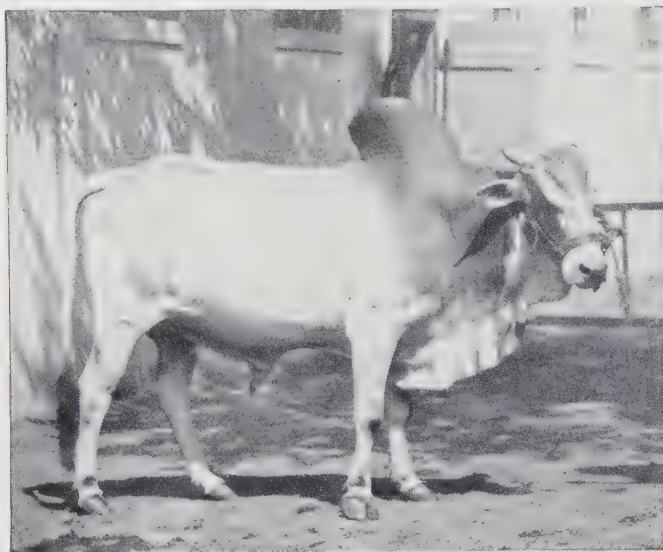
Considering the size and tenacity of life of the gaur, it is rather wonderful that more accidents do not occur in the pursuit of this animal; but as it lives mainly in thick jungle, where large trees grow, the sportsman has more chance of getting out of sight of a wounded animal than when attacked by the Indian buffalo, which generally haunts jungles of high grass.



Photo by York & Son

COW GAYAL

This animal is not at all dissimilar to the gaur. Its chief points of difference are in the horns and in the colour of its skin



INDIAN HUMPED BULL

The hump and dewlap mark the Oriental cattle. The ears are often more drooping than in this specimen

The offspring furnished excellent beef, but were rather wild and intractable. The horns of the gayal are thicker and flatter than those of the gaur, and placed lower on the skull and farther apart. The domesticated gayal stands lower than the gaur, but is a very massive animal.

THE GAYAL

The doubt whether this animal is found in a wild state has recently been considerably increased. It is well known in a semi-domesticated condition, in which it is kept by the tribes in and around the Assam Valley, where the wild gaur is also found. These herds roam during the day freely in the jungle, and return to be fed at the villages. It has been stated that wild gayal are enticed to join the tame herds by feeding them with balls of meal and salt; but these "wild" specimens may be only those which have belonged to or have descended from the domesticated herd. Gayal have been kept in England not only in the Zoological Gardens but in some parks, and crossed with English cattle.

THE BANTING

The common wild ox of the Malay countries of Borneo, Java, Eastern Burma, and northwards, in Manipur resembles the European oxen rather more than does the gaur. In size the bulls sometimes reach 5 feet 9½ inches. The old bulls are black, the younger bulls chocolate red, and the cows a bright reddish brown. The rump is marked with a large white patch, and all have white stockings from above the knees and hocks down to the hoofs. The tail is considerably longer than in the gaur, coming well below the hocks. As might be expected from its distribution, the size of this animal and the shape of the horns vary considerably in the different districts which it inhabits. In Borneo the horns often curve forwards; in Java they spread outwards. In the latter island large herds of this species are kept in a state of domestication. When wild, banting live in small herds, and in Burma feed from early morning until ten o'clock, when they retire into the jungle for shelter. The Manipur race is smaller than that of Burma (of which the males are not black), and the bulls have not the white rump.

THE YAK

THE YAK is naturally an inhabitant of the very high plateaux and mountains of Tibet, where the climate is cold and the air excessively dry. Lower down on the Indian side of the Himalaya a smaller race is found domesticated, which is the only one able to stand the climate of India, or of Europe, where it is now kept in some parks as a curiosity. The tamed yaks are usually much smaller than the wild; these sometimes reach a weight of between 1,100 and 1,200 lbs. In form they are long and low, very massive, and with hair almost entirely black; this falls off along the sides into a long sweeping fringe. The tail is thickly tasselled with fine hair, and is employed by Indian princes for fly-flaps. The wild yak has large, massive black horns, curved upwards and forwards in the male. In Ladak and Chinese Tibet the yaks inhabit a desolate and barren country, in which their main food is a dry,

coarse grass, on which they nevertheless contrive to keep themselves in condition, feeding in the mornings and evenings, and lying down by day to rest among the rocks.

THE BISON

THE BISON form a marked group, differing from others of the Ox Tribe. They possess fourteen pairs of ribs, while the oxen have only thirteen (the yak has fourteen); and have very heavy, massive heads, broader and more convex foreheads than the oxen, longer spinal processes on the vertebræ of the front part of the back, and larger muscles to hold the ponderous head, causing a hump, which in the American bison is very marked. There are two living species of bison, one of which is found in Europe, the other in North America.

THE EUROPEAN BISON

This is the most interesting survival of the primitive fauna of the Old World. It is still found wild, though protected, in a large forest in Lithuania, the property of the Czar of Russia, called the Forest of Bielowitza. A few are also left of the purely wild stock in the Caucasus. Those in Lithuania have been protected for several centuries, and the herd is numbered from time to time. In 1857 there were 1,898 of these bison left; in 1882 there were only 600; in 1889 the herd had sunk to 380, but in 1892 it had risen to 491. The presence of the bison in the Caucasus had been almost forgotten till Mr. Littledale and Prince Demidoff gave accounts of hunting it there quite recently. The ZUBR, as it is called, only survives in some very inaccessible parts of the mountains, preserved by the Grand Duke Sergius Michaelovitch, in the Kouban district. There it exists as a really wild animal. The dimensions of one recently shot were 10 feet from the muzzle to the end of the last vertebra of the tail. The Grand Duke has to obtain special permission from the Czar to shoot one whenever he goes to the Caucasus.

This bison seems to have been an inhabitant of most of the forests of Europe and Northern Asia; its remains show that it existed in Britain, and it was plentiful in the Black Forest in the time of Cæsar. It is the largest of all European quadrupeds, measuring as much as 10 feet 1 inch from the nose to the root of the tail, and standing nearly 6 feet high at the shoulder. Prince Demidoff states his belief that it is found on the southern slopes of the Caucasus Range between the hills and the Black Sea. The weight of this bison reaches 1,700 lbs. It is now rare to see more than five or six together. Though the animal is so massive, its horns are rather small and slender, and curve upwards. The mane—which, like the rest of the coat, is of a uniform rich brown—is thick and curly, but not developed like that of the American bison.

THE AMERICAN BISON

The American bison is the western representative of the bison of Europe. The almost complete disappearance of this species is one of the warnings against reckless destruction of animal life. It was formerly found in millions



INDIAN HUMPED CATTLE

These are often called Zebu in Europe, but the origin of the name is unknown



Photo by W. P. Dando]

[Regent's Park

DOMESTICATED YAK

The wild bovine animal of the Central Asian plateau, tamed and domesticated

on the prairies, and its meat formed the staple food of the Red Indians, who lived on the flesh and used the "robes" of those killed in winter for great coats and bedding. When Audubon went up the Upper Missouri, bison were in sight almost throughout the voyage; they were even carried down on ice-flows on the river. The bulls were very large, and were occasionally savage, especially when attacked and wounded; but usually they were harmless animals. Every winter and spring they made migrations along regular routes to fresh pastures. These lines of travel were then black with bison. The females had their calves by their sides, and all travelled in herds, feeding as they went. At the present time the only remains of the bison are the paths they left on the prairies, and their bones and skulls. The paths are still distinctly seen, worn by the "treks" of the great beasts which

have now perished. The bones were collected in stacks and sold to make manure.

President Roosevelt, in an article contributed to "The Encyclopædia of Sport," thus describes the destruction of the bison: "Pursuit by sportsmen had nothing to do with the extermination of the bison. It was killed by the hide-hunters, redskin, white, and half-breed. The railways, as they were built, hastened its destruction, for they gave means of transporting the heavy robes to market. But it would have been killed out anyhow, even were there no railroads in existence. Once the demand for the robes became known to the Indians, they were certain to exterminate it. Originally the bison ranged from the Rocky Mountains to the Alleghanies, and from Mexico to the Peace River. But its centre of abundance was the vast extent of grass land stretching from the Saskatchewan to the Rio Grande. All the earlier explorers who crossed these great plains, from Lewis and Clarke onwards, spoke of the astonishing multitudes of the bison, which formed the sole food of the Horse Indians. The herds were pressed steadily back, but the slaughter did not begin till after the Civil War; then the commercial value of the robes became fully recognised, and the transcontinental railways rendered the herds more accessible. The slaughter was almost incredible, for the bison were slain literally by millions every year. They were first exterminated in Canada and the southern plains. It was not till 1883 that the last herd was killed off from the great north-western prairies."

The height of a fine bull American bison at the shoulder is 6 feet. The horns are short, blunt, and curved, and set farther back on the forehead than in the European species. The hindquarters are low and weak, and the mane develops in winter into a thick robe, covering the neck, shoulders, and chest. An adult bull bison was found to weigh 1,727 lbs. The woodland bison of Athabasca, now nearly exterminated, are larger than the prairie-bison, and have finer coats. In 1897 there were said to be between 280 and 300 head remaining in two herds.

THE BUFFALOES

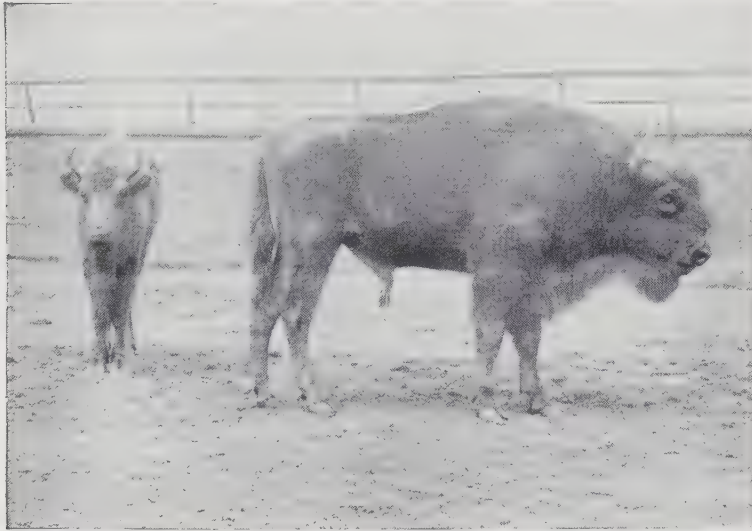
THE BUFFALOES are so far distinct from other wild cattle that they will not interbreed with them: yet one species, the INDIAN BUFFALO, has been domesticated for a long, though



By permission of the New York Zoological Society

AMERICAN BULL BISON

The American bison (locally called "buffalo") is lower behind than its European brother; but the withers, as will be seen from the photograph, are stronger and more massive, and its mane considerably longer



EUROPEAN BISON

These wild animals of the Caucasus are very much scarcer than formerly, and are in danger of becoming extinct

unknown period, and is among the most valuable of tame beasts of draught, as well as for dairy purposes. The various buffaloes usually have little hair, especially when old, and have flatter shoulders than the gaur, gayal, or bison. The pairs of ribs number thirteen.

THE AFRICAN BUFFALO

Great differences in size and colour exist in the AFRICAN BUFFALOES. Whether they are separate species or not may be doubtful; but the small yellow CONGO BUFFALO, with upturned short horns, is a vastly different creature from the large black

CAPE BUFFALO. There is also an Abyssinian or brown race of African buffalo, and another in Senegambia smaller than the former, and a reputed grey race near Lake Tchad. The Cape buffalo is a heavy, thickset animal, all black in colour, with large massive horns covering the skull, and nearly meeting in the middle line of the forehead. In height it varies from 4 feet 10 inches to 5 feet at the shoulder. This species ranges from South Africa to the Congo on the west, and to the region of the Equator on the east of the continent. Firearms, and lately rinderpest, have greatly reduced the number of these creatures. They live and feed in herds, and, like the Indian species, are fond of the neighbourhood of water, in which they bathe, but are not so dependent on bathing and wallowing as the former.

Fully as formidable as the Indian buffalo, and much like it in habits, the African species is quite distinct. It has different horns, broad at the base and curled and tapering at the ends. Among the extreme measurements of the Indian buffalo's horns recorded is one of 12 feet 2 inches from tip to tip along the curve. Those of the African buffalo are seldom more than 6 feet, measured in the same way. By far the greatest number of hunting accidents in Africa are caused by the buffalo. Sir Samuel Baker shot a buffalo bull one evening near the White Nile. His men actually danced upon the body, when the animal rose to its feet, and sent them flying into the river like so many frogs. It then disappeared in the thick vegetation. On the following day, supposing that it must have died during the night, thirty or forty men, armed with double-barrelled guns, went to look for it. The result was thus recorded by Sir Samuel Baker: "They had not been ashore for many minutes when I first heard a shot and then a regular volley. My people returned with the head of the buffalo and a large quantity of meat, but they also carried the body of my best man, who, when leading the way through the high reeds, following the traces of blood, actually stumbled upon the buffalo lying in the swamp, and the light guns failed to stop its charge. The crooked horn had caught him behind the ear, and, penetrating completely through the neck, had torn out the throat as though it had been cut. The savage beast had then knelt upon the body, and stamped it into the muddy ground, until it fell beneath the fire of thirty men."

The head and body of a male Cape buffalo are 9 feet long. It is stated that the parasite conveyed by the tsetse fly remains in the blood of the buffalo (which is not affected by it), and that this forms a reserve whence the fly, after sucking the blood of the buffalo, poisons other animals.

THE CONGO BUFFALO

This is a very small race, the height at the shoulder being about 3 feet 6 inches. The shape of the horns varies, but they are wrinkled at the bases and flattened, and turn upwards, ending in thin, sharp tips. The hair is bright reddish yellow. It is entirely a West African species. Sir Samuel Baker records an instance in which his brother was nearly killed by a small West African buffalo, probably one of the species in question. It is said to be less gregarious than the Cape buffalo, and usually found in pairs.

THE INDIAN OR WATER-BUFFALO

Very great interest attaches to this animal, if only from the fact that it is evidently a species domesticated directly from the wild stock. It therefore deserves consideration both as a wild and as a domesticated animal. It is found wild in the swampy jungles at the foot of the Himalaya, in the Ganges Delta, and in the jungles of the Central Provinces; also, it is believed, in the jungles of West Assam. Like the African species, it is an animal of great size and strength, with short brown hair, white fetlocks, and immense long, narrow, flattened horns. It is almost aquatic by preference, passing many hours of each day wallowing in the water, or standing in any deep pool with only the tips of its nostrils and its horns out of the water. By general consent it is the most dangerous of Indian animals after the tiger. A buffalo bull when wounded will hunt for its enemy by scent as persistently as a dog hunting for a rabbit. A writer in *Country Life* lately gave an account of a duel between himself, armed with a small and light rifle, and a buffalo bull, in which the latter hunted him for more than an hour, each time being driven off by a shot from the light rifle, and each time returning to the search, until it was killed. Sir Samuel Baker, when he first went to Ceylon, found the buffaloes practically in possession of the meadows round a lake in the neighbourhood of his quarters, and waged a war of extermination against the bulls, which were very dangerous.



AMERICAN BISON

Notice the difference in the fore and hind quarters of this animal and the European representative of the same group. (See page 216.)



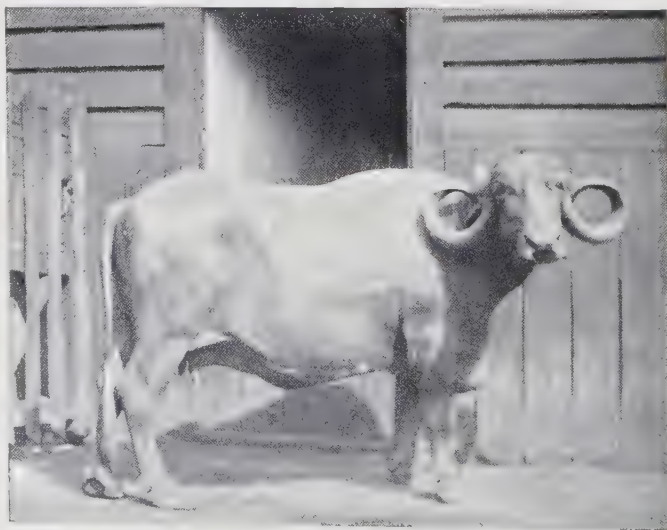
CAPE BUFFALO

Notice the striking difference depicted on this page between the two species of buffalo—the Indian and the Cape

with its horns, but will kneel upon the lifeless form, and stamp it with its hoofs till the mutilated remains are beyond recognition."

The true Indian buffalo is usually shot from the back of an elephant. Hunting it on foot is dangerous in the extreme, for the buffalo can crash through obstacles which would prevent any man from making his way through them when escaping. When domesticated, the Indian buffalo loses most traces of its savageness; it is habitually managed by the children, who take the herds out to graze in the jungle, and drive them back, often riding on one of the bulls, at night. They dislike Europeans, and often show this by attacking them; but otherwise they are quite tame, and are docile when in harness or carrying burdens. The buffalo's milk is very rich, and makes a much larger per-

The buffaloes of Ceylon are the same as those of India, but the horns are inferior in size. "The charge of a buffalo is a serious matter," says Sir Samuel Baker. "Many animals charge when infuriated, but they can generally be turned aside by the stunning blow of a rifle-shot, even if they be not mortally wounded. But a buffalo is a devil incarnate when it has once decided on the offensive; nothing will turn it. It must be actually stopped by death, sudden and instantaneous, as nothing else will stop it. If not killed, it will assuredly destroy its adversary. There is no creature in existence so determined to stamp the life out of its opponents, and the intensity of its fury is unsurpassed when a wounded bull rushes forward upon its last desperate charge. Should it succeed in overthrowing its antagonist, it will not only gore the body



DOMESTICATED INDIAN BUFFALO

This animal is found as a wild and domesticated species in India. It is valuable as a beast of draught and for the dairy

centage of butter than ordinary cow's milk. So useful is this mud- and water-loving animal in all swampy districts, that wherever rice is cultivated it is almost indispensable. The result is that the Indian buffalo has been transported, probably in comparatively modern times, to many distant quarters of the globe. When this was done is not known; but it is probable, for instance, that it was not known in Egypt in the days of the Pharaohs, for its form never appears in the paintings and sculptures. Now it is seen very far up the Nile, and plays an important part in Egyptian agriculture; it is also the general beast of burden and for the dairy in the Pontine Marshes of Italy. In Spain it was probably introduced by the Arabs, and is used to cultivate the marshy plains near the mouths of the rivers of Andalusia; it is also in use in the marshes of Hungary, in the Crimea, and across Western Asia to Afghanistan. We have thus the curious fact that a wild animal once confined to the jungles of the Indian Peninsula is now domesticated on two other continents. It has not been



A PAIR OF ANOAS

The anoa is the smallest and most antelope-like member of the Ox Tribe

introduced into America yet, though it would be useful in the Mississippi swamps; but the Chinese have taken it to the Far East, and established it as their favourite beast of burden.

THE TAMARAU AND ANOA

In the island of Mindoro, in the Philippines, a small black buffalo, with upright, slightly incurved horns, is found in the dense forests. The height at the shoulder is about 3 feet 6 inches; a few irregular marks of white are found on the fore legs, face, and occasionally the throat. It is called the TAMARAU by the natives, most of whom fear to attack it. Its habits are said to be much the same as those of the other buffaloes; but it is reputed to fight with the Indian buffaloes which have escaped and become semi-wild in the forests.

In Celebes a still smaller wild forest-buffalo is found, called the ANOA. It is only 3 feet 3 inches high at the shoulder, and has upright, almost straight horns. The general colour is brownish, tinged with yellow, that of the adults being very dark brown or black. Scarcely anything is known of its habits.

THE MUSK-OX



YOUNG BULL MUSK-OX

The musk-ox is nearly allied to the sheep. It is about the size of Highland cattle, and inhabits Arctic America and Northern Greenland

THE MUSK-OX was formerly found in immense numbers on the barren lands and other regions bordering on the Arctic ice. The hair of this animal reaches almost to the ground, and the horns are large and massive. At present it is only common in the corner of North America north and east of a line drawn from Fort Churchill, on Hudson Bay, to the mouth of the Mackenzie, and on the adjacent islands of the Arctic Sea. In former Arctic expeditions the flesh of the musk-oxen was a great and reliable source of food. Now some parts of the herds seem to have retired inland, and in the winter to become mainly forest-dwellers; but large numbers seem to endure the coldest parts of the Arctic winter in the open country of the Far North, in the snows of Grinnell Land and of Northern Greenland. The remains of musk-oxen have been found in the river gravels of the Thames Valley, with those of the reindeer and other northern species. The musk-ox

gallops at a great rate of speed when disturbed in the open, and makes as little of a steep mountain-side as does the wild sheep. When fat, the flesh is very tolerable food; but if the animals grow thin, the taste of musk is very unpleasant. The colour of the coat is dark brown; it is now in great demand for sledge-rugs in Canada. This remarkable animal appears to be a form standing apart both from the oxen and the sheep.

It will be seen from the above accounts of the whole wild bovine race that they all exhibit in a high degree many of the traits which are seen in domesticated animals of the same tribe. The chief differences made by man's selection and breeding affect the form of the body and the development of the udder, otherwise there is no great modification, except the production of the drooping ear in some of the Indian species of domesticated oxen. No wild cattle have the level, flat back and rectangular body which mark all the best shorthorns and other breeds intended for beef. In the Asiatic and Galla humped breeds, the races which first domesticated the original wild species seem to have used the long processes of the vertebræ which cause the back of many wild cattle to form a hump as the basis of a valuable feature, the hump becoming as it were another joint of meat. The development of the udder has for untold centuries been the object of the breeders of cows; consequently we find that in the domesticated races this has become abnormally large. There is at present a very general tendency to get rid of the horns among all breeds of high quality, as these appendages cause much loss by wounds inflicted by cattle upon each other; but even in this respect sentiment rather tends to preserve the horns as an ornament in some of the best milking breeds, such as the Jerseys.

CHAPTER XIV

THE SHEEP AND GOATS

THE SHEEP

THE sheep are represented at the present time by several wild species, one of which is found in Northern India east of the Indus, in the Punjab, and in Sind; one in North America; and another in North Africa. The rest inhabit the high ground of Europe and Asia as far south as the Himalaya. These mountains, with the adjacent plateaux of the Pamirs and the great ranges of Central Asia, form the main home of the group. Wild sheep are of various types, some so much like the goats that it is difficult to draw a hard-and-fast line between them; while others, especially the Curly-horned Argalis, Bighorns, Oorial, and Kamchatka Wild Sheep, are unmistakably ovine in type. The wild original of the domesticated breeds of sheep is unknown; but the extreme differences between various breeds of tame sheep — as, for instance, between the smooth-coated, drooping-eared breed of Nubia and the curly-horned, woolly sheep of Dorsetshire — must not be allowed to divert the attention from the considerable likeness of habit which still remains between other breeds and the wild species. Domesticated sheep which live on hills and mountains are still inclined to seek the highest ground at night. The rams fight as the wild rams do, and many of them display activity and powers of climbing and of finding a living on barren ground scarcely less remarkable than in the wild races.

The apparent absence of wool in the latter does not indicate so great a difference as might be thought. The domesticated sheep have been bred by artificial selection for unnumbered ages in order to produce wool. It is said that in some of the wild breeds there is an under-fur which will "felt" like wool. Most of the species are short-tailed animals, but this is not the case with the Barbary wild sheep.

Wild sheep are mainly mountain-living animals or frequenters of high ground. They generally, although not always, frequent less rugged country than that affected by the wild goats, and some are found at quite low levels. The altitude at which other wild sheep are found is, however, very great; on the Pamirs it reaches 20,000 feet. Here the country is quite open.

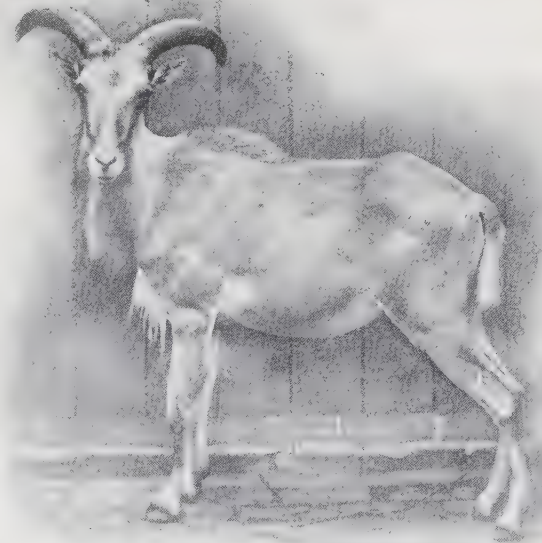


Photo by G. W. Wilson & Co., Ltd.

YOUNG BARBARY SHEEP

Note the length of the tail as compared with other wild sheep

THE EUROPEAN MOUFFLON

The only wild sheep of Europe is the MOUFFLON, found in the mountains of Corsica and Sardinia. Its height at the shoulder is about 27 inches. In the rams the horns are strong, and curved into a spiral, forming almost a complete circle. The hair is close, and in winter has a woolly under-fur. In summer and autumn the coat is a bright red-brown on the neck, shoulders, and legs; the rump and under-parts are whitish, and the back and flanks marked with a white saddle. In winter the brown becomes darker and the white saddle broader. A rather larger moufflon is found on Mount Elburz in Persia, in Armenia, and in the Taurus Mountains. A smaller variety exists in Cyprus, where it has been preserved since the British occupation. The moufflon is a typical wild sheep. In Sardinia and Corsica are dense scrubby forests of tall heather, some 5 feet high. This *maquia* is practically impenetrable to hunters. When alarmed, the moufflon dash into it, and are safe. The *maquia* has preserved two very interesting survivals of antiquity — the moufflon, and the Corsican or Sardinian bandit. The Corsican bandit,



Photo by W. P. Dando

SIBERIAN ARGALI

One of the large wild sheep of Central Asia

like the moufflon of the same island, is nearly extinct. In Sardinia both flourish. Many sportsmen have had their first taste of big-game shooting in the difficult pursuit of the moufflon on the Sardinian mountains. Some declare that the sport is so fascinating that they have seldom found much to equal it since. Mr. S. H. Whitbread, whose notes in "The Encyclopædia of Sport" are very full on this subject, deems that the best season to stalk moufflon is in October or November. The animals are then less disturbed by shepherds and dogs, and the moufflon are on the move and more easily seen during the day than in summer, when they feed at night and rest or sleep by day.

There is a small herd of moufflon running wild in one of the English parks. They have a specially built "mountain-top" of stone to make a

home of, but are free to feed where they like in the park. They produce lambs yearly. It is an interesting sight to see the quick rush of the little flock, when frightened, to their sheltering-place, led by an old white saddled ram.

THE ARGALIS

The ARGALIS are the largest of all living wild sheep. Some measure from 3 feet 9 inches to 4 feet at the shoulder. The horns are broad, corrugated, and curling in the male, and in the female short, erect, and curving backwards. The male TIBETAN ARGALI has a ruff on the throat. The usual colour is a stony grey, mingled with white in the summer in the case of the old males. The name is applied collectively to several wild sheep found in Northern and Central Asia. Whether these are only varieties or separate species it is difficult to say; but the following are some of the most marked forms.

The SIBERIAN ARGALI is the characteristic wild sheep of the rocky hills and mountains of Southern Siberia, the Altai Mountains, and Northern Mongolia. The horns curve so as to form more than a complete circle; the upper parts are tinged with grey, and the lower are white.

The TIBETAN ARGALI is a little smaller in size, and has slightly smaller horns. The rams have also a large white ruff on the throat. These sheep descend in winter to the lower valleys of the Tibetan plateau, returning to the higher ground in spring. The lambs are born in May or June.

LITLEDALE'S SHEEP is a smaller animal, found on the Sair Mountains in the Great Altai, on the northwestern border of Mongolia. It is darker in colour than the argali or Marco Polo's sheep, and has dark under-parts.

Writing of the argali of Southern Siberia, the naturalist Brehm says that when the Tartars want mutton an argali hunt is organised. The Tartar hunters advance on their horses at intervals of 200 or 300 yards, and when the sheep are started generally manage, by riding, shooting, coursing them with dogs, and shouting, to bewilder, shoot, or capture several.

On the high plateau of the Pamirs and the adjacent districts MARCO POLO'S SHEEP is found. The rams are only slightly less in size than the Siberian argali; the hair is longer than in that species, and the horns are thinner and more slender and extend farther in an outward direction. An adult ram may weigh 300 lbs. The first description of this sheep was given by the old traveller whose name it now bears. He said that on the Pamir plateau wild

animals are met with in large numbers, particularly a sheep of great size, having horns three, four, and even six palms in length. The shepherds (? hunters) form ladders and vessels from them. In the Pamirs, Marco Polo's sheep is seldom found at less than 11,000 or 12,000 feet above the sea. In the Thian-shan Mountains it is said to descend to 2,000 or 3,000 feet. They prefer the hilly, grassy plains, and only seek the hills for safety. On the Pamirs they are said to be very numerous in places, one hunter stating that he saw in one day not less than 600 head.

THE BIGHORN SHEEP OF AMERICA AND KAMCHATKA

North America has its parallel to the argalis in the famous BIGHORN. It is now very rare even in Northern



BARBARY SHEEP

These fine wild sheep are found in the Atlas and Aures Mountains of North Africa



BARBARY SHEEP

This shows a fine ram, with a mane reaching almost to its hoofs



Photo by J. W. McLellan

BURHAL WILD SHEEP

Sometimes called the Blue Sheep. They have a wide range both on the Himalaya and north of those mountains

stone, which they lick and gnaw until sometimes deep tunnels are formed in the cliffs, large enough to hide six or seven sheep. The hunter, standing over one of these warrens, may bolt them within two yards of him. In the dead of winter sheep often come to the woods to feed on fir-trees. At such times they may be seen mixed with black-and-white-tailed deer, low on a river-bank. I have known them come within forty yards of an inhabited hut."

While on the subject of the fondness of sheep and deer for salt, we may mention an anecdote told by Mr. H. C. Nelson in *Country Life*. He was sleeping with two other friends in a hut in the mountains where some miners had lived for a time. These men, when they washed up their pots and pans, threw the slops away at a certain place close by the hut. As all water used for cooking meat has salt put into it, a little salt remained on the surface. This the wild deer had found out, and were in the habit of coming to lick it at night. Mr. Nelson had a shot at one some twenty yards from the hut.

The bighorn sheep stands from 3 feet 2 inches to 3 feet 6 inches at the shoulder. The horns are of the general type of the argalis, but smoother. Another bighorn is found in Kamchatka. There is also a beautiful white race of bighorn inhabiting Alaska. The typical Rocky Mountain race is browner than the Asiatic argalis, and in winter is dark even beneath the front parts of the body. It is not found on the high peaks of the great ranges, but on difficult though lower ground on the minor hills.

THE OORIAL

The vast range of the Himalaya affords feeding-ground to other species of wild sheep and wild goat, so different in the shape of the horns that the variations of the ovine race under domestication need not be matter for wonder when so much variety is seen in nature.

The OORIAL, or SHA, is found in North-west India, on the Trans-Indus Mountains, and in Ladak, Northern Tibet, Afghanistan, Baluchistan, Turkestan, and Southern Persia. The horns make a half-curve backwards, and are flattened. The angle with the horizontal line across the ears is about half a right angle. The coat is of a reddish-brown colour, with white on the belly, legs, and throat. This species has a very wide geographical distribution, and is the only wild sheep found in India proper.

Canada, and becoming scarce in the United States, though a few are found here and there at various points on the Rocky Mountains as far south as Mexico. In habits it is much the same as other wild sheep—that is to say, it haunts the rock-hills and "bad lands" near the mountains, feeding on the scanty herbage of the high ground, and not descending unless driven down by snow.

The bighorn sheep are very partial to salt. Mr. Turner Turner, who hunted them in East Kooteney, says: "Wild sheep make periodical excursions to the mountain-tops to gorge themselves with salty clay. They may remain from an hour to two days, and when killed their stomachs will be found full of nothing but the clay formed from denuded lime-

THE BARBARY SHEEP, AOUDAD,
OR ARUI

This is a large wild sheep of the North African highlands. The old rams have a very fine appearance, with a long flowing beard or mane, and large horns. These wild sheep, though somewhat goat-like in appearance, are typical of their race in general habits. They live in the Atlas Range, and in the splendid heights of the Aures Mountains, which lie at the back of Algeria and fringe the great Sahara Desert. In the isolated and burning rocks which jut up in the desert itself into single mountains they are also found, living on ground which seems absolutely destitute of water, grass, or vegetation. They live singly or in small families; but the rams keep mainly alone. Sometimes they lie in shallow caves during the heat of the day. These caves smell like a sheep-fold. More generally the sheep repose on some shelf of rock, where they exactly match the colour of the stone, and are invisible. The ground is among the most difficult in which any hunting is attempted, except perhaps in chamois stalking; but the pursuit seems to fascinate sportsmen. Mr. A. E. Pease recently



Photo by J. T. Newman]

[Berkhamssed

PUNJAB SHEEP

This is an example of one of the breeds which carry no wool whatever



Photo by L. Medland, F.Z.S.]

[North Finchley

FAT-TAILED SHEEP

The fat tail of this sheep was considered by Charles Darwin as due to degeneration

gave some charming descriptions of the silence, the rugged rocks, and the astonishing views over the great orange Sahara Desert seen from the tops of these haunts of the Barbary sheep—mountains on the summits of which his Arab guides would prostrate themselves in evening prayer as the sun sank over the desert, and then, rising, once more resume the chase. The young lambs of the Barbary sheep are charming little creatures, more like reddish kids. They can follow the mother over the steepest ground at a great pace. When caught, as they sometimes are by the Arabs, they soon become tame. The



Photo by W. P. Dando]

[Regent's Park

FOUR-HORNED SHEEP

There are several breeds of these sheep, some from China, some from Iceland, and others from South Africa

from the brown of the flanks, and run down the front of the legs, are like those seen on some goats. The horns rise in a curve outwards and downwards. The largest are only some 30 inches long.

Burhal are perhaps the commonest of all Asiatic wild sheep. They inhabit the whole length of the higher Himalayan Range, and are found over and round the Central Asian plateau as far north as Yarkand. The horns make two half-moons at right angles to the skull. Unlike some of the other wild sheep, burhal often climb the very highest ground of all. Much of the best burhal ground is above 17,000 feet high, and, as Mr. Whitbread remarks, this alone makes the chase of such an animal difficult. As in the moufflon, the mutton is excellent. There is no difficulty whatever in taming these wild Himalayan sheep; those in the Zoological Gardens are practically domesticated.

DOMESTICATED SHEEP

Under domestication sheep exhibit a wide variety of coat, shape, and size, very striking to the eye, and very important in regard to the produce of wool or mutton. The introduction of a particular breed, with long wool or short wool as the case may be, has often saved or altered for a time the economic condition of a colony or province. It was the introduction of the sheep which gave Australia first rank among the rich colonies of the world; and the discovery that the Cheviot breed would thrive on the Scotch hills made millions of acres remunerative which might otherwise have been very unproductive. But the only important change in the structure of the sheep in domestication is the lengthening of the tail. The carcase may be fat mutton or thin mutton, the wool long or short, fine or coarse; but the sheep itself remains true to type, and of much the same docile habits, under all the changes of the breeders.

tail is longer than in other wild sheep, and in the males a large mane covers the chest.

THE BURHAL, OR BLUE SHEEP

This species possibly indicates the transition-point from the sheep to the goats. It was pointed out by Mr. Brian Hodgson that it had certain features more like the goats than the sheep, and later other writers laid stress on structural differences of the same kind, both in skull and horns. It has not the disagreeable odour of the goats; but the black markings which separate the white of the belly



Photo by J. T. Newman]

[Berkhamsted

SOUTH DOWN SHEEP

The finest breed of down-sheep

We may first say a word or two as to foreign breeds of sheep, especially those of the East. Some of these resemble the wild breeds in having smooth coats and almost no wool. The SOMALI SHEEP, for instance, yield no wool useful for felting or spinning. They have drooping ears and black heads. Some of the finest natural wool is developed by a white sheep in Tibet. The fur is usually sold as Tibetan lamb. The wool is exactly like white floss-silk. When cured by the Chinese, the leather is like white kid, with this flossy wool attached.

In India and Persia the sheep is sometimes used as a beast of burden. Mr. Lockwood Kipling, in his "Beast and Man in India," says: "Borax, asafoetida, and other commodities are brought into India on the backs of sheep in bags. The flocks are driven in large numbers from Tibet into British territory. One of the sensations of journeying in the hills of the 'interior,' as the farther recesses of the mountains are called by Anglo-Indians, is to come suddenly on such a drove, as it winds, with the multitudinous click of little feet, round the



Photo by W. Reid]

[Wishaw, N.B.]

MERINO RAMS

The best wool-producing sheep. Imported from Spain to Australia

shoulder of some Himalayan spur. The coarse hair bags scrape the cliffside from which the narrow path is built out or hollowed, and allow but scant room for your pony, startled by the hurry and the quick-breathing rush of the creatures as they crowd and scuffle past. Only the picturesque shepherds return from these journeys. The carriers of the caravan (*i. e.* the sheep), feeding as they go, gather flesh in spite of their burdens, and provide most excellent mutton. . . . In the towns of the plains rams are kept as fighting animals. A Mohammedan swell going out for a stroll with his fighting-ram makes a picture of foppery not easily surpassed by the sporting 'fancy' of the West. The ram is neatly clipped, with a judicious reservation of the salient tufts, tipped with saffron and mauve dye, and besides a large collar of blue beads it wears a necklace of hawk-bells."

The FAT-TAILED SHEEP of Persia and Tartary exhibits a curious provision of nature. When food is plentiful, a quantity of fat accumulates on the tail and croup. As the pasture dries up and the animal finds little food, this store of fat is gradually absorbed. Another fat-tailed sheep is found from Syria and Egypt to the Cape. This has a long tail reaching to the



Photo by J. T. Newman]

[Berkhamsted

BLACK-FACED MOUNTAIN-SHEEP*The sheep of the high mountains and heather-moors*

for we learn that "Abel was a keeper of sheep," while Cain tilled the earth. The feud between the keeper of flocks and the grower of crops typified in this ancient quarrel still goes on wherever the wild mountain breeds of sheep are kept, for there is of necessity always danger that the wandering sheep may raid the plots of corn. In Spain a curious and ancient set of laws regulates the passage of the flocks to and from the mountain pastures through the corn-lands.

It is said that the name of the famous breed of Spanish sheep known as MERINOS recalls their foreign origin from across the sea, and that they were originally imported into Spain from England. Whether that be so or not, it is certain that no one could recognise them now. The finest merino sheep, especially those bred in Australia, into which country they were imported some forty years ago, look as if covered with a dense growth of moss. The close wool grows not only on their backs, sides, and bellies, but on legs, forehead, and nose. There are believed to be ten millions of merino sheep in Spain, most of which are migratory. They are called "transhumantes," and are taken from the plains to the mountains and from the mountains to the plains yearly. These

ground. In the Egyptian breed the tail is broad throughout; in the Syrian it narrows to a point. The ordinary weight of the Syrian sheep's tail is 15 lbs.; but in some well fattened examples it reaches 70 or 80 lbs. Ludolph saw in Egypt a sheep's tail of 80 lbs. weight. This overgrown tail is a great encumbrance to the animal. In order to lighten the burden, the shepherds fasten under it a small board, sometimes with wheels attached, to make it easy to draw over the ground.

In Greece, Wallachia, and Western Asia a fine breed of sheep, quite different from the English forms, is seen. It is called the WALLACHIAN SHEEP. When the Zoological Gardens were first founded here, some of these sheep were introduced and crossed with English breeds. The horns are tall spirals, as in the great kudu antelope. The body is large, and the fleece long and straight, and more like that of the long-haired goats than curly wool.

There are now few countries in the world to which sheep have not been introduced. They were probably among the earliest animals to be domesticated. Certainly they are the first to be mentioned;



Photo by J. T. Newman]

[Berkhamsted

LEICESTER EWE*A heavy, long-woolled breed*

"transhumantes" are divided into flocks, each under a head shepherd, or "majoral." The flocks follow the shepherds, who lead the way, and direct the length and speed of the journey. A few wethers, trained to the business, follow the shepherds, and the rest come in due order. Powerful dogs accompany them as guards. This system of sheep migration is controlled by a tribunal termed the Mesta. It can be traced back to the middle of the fourteenth century. By it persons are prohibited from travelling along the course of the route pursued by the flocks so long as they are on the road. It also maintains the right for the flocks to graze on all the open or common land that lies in the way. Moreover, it claims a path ninety yards wide through all enclosed and cultivated country. The length of the journey is over 400 miles, which is accomplished in six or seven weeks. The system works greatly to the injury of local cultivators and stationary flocks, whose fields are injured by the migratory sheep.



Photo by W. Reid

[Wishaw, N. B.]

CROSS-BRED SHEEP

The class of sheep kept mainly on cultivated land in the North Midlands

ENGLISH BREEDS OF SHEEP

In England are reared the finest and most valuable sheep. This is evident from the prices paid for them by foreigners and breeders in our colonies. Except for merinos, no one comes to any other country but this when about to seek new blood for their flocks or to stock new lands. Recently 1,000 guineas were paid by a firm in Argentina for a single Lincoln ram.

Differences, well marked and of great importance, exist between our different breeds. Each suits its own district, and each is carefully improved and kept pure by herd-books, in which all pedigree animals are entered.

The "general utility sheep" in England is the SOUTH DOWN; in Scotland, the BORDER LEICESTER. The former is a small, fine sheep, with close wool, and yielding excellent mutton. It provides the meat sold in our best shops, and has largely stocked New Zealand. The original breed of England was possibly the COTSWOLD; it is a tall, long-woolled, white-fleeced



Photo by J. T. Newman]

[Berkhamsted

LONK RAM

This is a photograph of the largest sheep on record

small heather-sheep like those of Wales, and the SOA and ST. KILDA SHEEP, which are often four-horned, the smallest of all.

The maintenance of flocks is now almost an essential part of English agriculture on all chalk lands, which comprise a very large percentage of the southern counties. On the chalk downs the flocks are the great fertilisers of the soil. Every night the sheep are folded on the fields which are destined to produce corn in the following year. The manure so left on the soil ensures a good crop, with no expense for carting the fertiliser from the farmyard, as is the case with manure made by oxen kept in straw-yards.

On the South Downs, Oxfordshire Downs or Chiltern Hills, Salisbury Plain, and the Berkshire Downs the farms have been mainly carried on by the aid of the flocks. Where these are no longer kept the land reverts to grass, and the growing of corn ceases. On the coarse, new-sown grasses cattle take the place of sheep, and an inferior style of farming, like the ranches of South America, replaces the careful and highly skilled agriculture of Old England. In the far north of Scotland cross-bred sheep are now reared and fed in winter on turnips, which will grow luxuriantly where the climate is too bleak and wet for wheat.

Formerly cattle were the main source of wealth to the owners of Highland estates. The sheep was only introduced after the Highlands were subdued subsequently to the rebellion in 1745. It was found that the rough-coated heather-sheep thrive on the wet and elevated hills. This led to their substitution for cattle, as wool was then dear. Sheep are now in their turn giving way to grouse and deer over much of the Central Highlands, as the price of wool has fallen.

sheep. Later a large heavy sheep, with long wool and a massive body, was bred in the Midlands, and called the LEICESTER LONG-WOOL. This sheep gives a great cut of wool, and much coarse mutton. The CHEVIOT SHEEP, originally bred on the hills of that name, is now one of the mainstays of the Scotch mountain farmer. The Cheviots eat the grass on the high hillsides, while the BLACK-FACED HIGHLAND SHEEP live on the heather higher up. The SUFFOLK, OXFORD, HAMPSHIRE, and other "Down" sheep are larger breeds than the South Down. The ROMNEY MARSH SHEEP are a heavy long-woolled breed. The EXMOORS are



Photo by J. T. Newman]

[Berkhamsted

WELSH EWES

A small breed of hill-sheep

THE GOATS

Though the dividing-line between the Sheep and Goats is very indistinct, some differences are of general application. The goats are distinguished by the unpleasant "hircine" odour of the males, and by beards on the chins of the same sex, by the absence of glands in the hind feet, which sheep possess, and by certain variations in the formation of the skull. The difference between the temperament of the sheep and goats is very curious and persistent, showing itself in a marked way, which affects their use in domestication to such a degree that the keeping of one or the other often marks the owners as possessors of different degrees of civilisation. Goats are restless, curious, adventurous, and so active that they cannot be kept in enclosed fields. For this reason they are not bred in any numbers in lands where agriculture is practised on modern principles; they are too enterprising and too destructive. Consequently the goat is usually only seen in large flocks on mountain pastures and rocky, uncultivated ground, where the flocks are taken out to feed by the children.

On the high alps, in Greece, on the Apennines, and in Palestine the goat is a valuable domestic animal. The milk, butter, and cheese, and also the flesh of the kids, are in great esteem. But wherever the land is enclosed, and high cultivation attempted, the goat is banished,

and the more docile and controllable sheep takes its place. In Syria the goat is perhaps more docile and better understood as a dairy animal than elsewhere in the East. The flocks are driven into Damascus in the morning; and instead of a milk-cart calling, the flock itself goes round the city, and particular goats are milked before the doors of regular customers.

The EUROPEAN GOAT is a very useful animal for providing milk to poor families in large towns. The following account of its present uses was recently published: "The sheep, while preserving its hardy habits in some districts, as on Exmoor, in Wales, and the Highlands, adapts itself to richer food, and acquires the habits as well as the digestion of domestication. The goat remains, as in old days, the



Photo by E. Landor]

[Ealing

FEMALE ANGORA GOAT

The breed from which mobair is obtained



Photo by E. Landor]

[Ealing

ANGORA RAM

These goats were originally obtained from Turkey in Asia, and exported to South Africa

enemy of trees, inquisitive, omnivorous, pugnacious. It is unsuited for the settled life of the English farm. Rich pasture makes it ill, and a good clay soil, on which cattle grow fat, kills it. But it is far from being disqualified for the service of some forms of modern civilisation by the survival of primitive habits. Though it cannot live comfortably in the smiling pastures of the low country, it is perfectly willing to exchange the rocks of the mountain for a stable-yard in town. Its love for stony places is amply satisfied by the granite pavement of a 'mews,' and it has been ascertained that goats fed in stalls and allowed to wander in paved courts and yards live longer and enjoy better health than those tethered even on light pastures. In parts of New York the city goats are said to flourish on the paste-daubed paper of the advertisements, which they nibble from the hoardings. It is beyond doubt that these hardy creatures are exactly suited for living in large towns; an environment of bricks and mortar and paving-

stones suits them. Their spirits rise in proportion to what we should deem the depressing nature of their surroundings. They love to be tethered on a common, with scanty grass and a stock of furze-bushes to nibble. A deserted brick-field, with plenty of broken drain-tiles, rubbish-heaps, and weeds, pleases them still better. Almost any kind of food seems to suit them. Not even the pig has so varied a diet as the goat; it consumes and converts into milk not only great quantities of garden stuff which would otherwise be wasted, but also, thanks to its love for eating twigs and shoots, it enjoys the prunings and loppings of bushes and trees. In the Mont d'Or district of France the goats are fed on oatmeal porridge. With this diet, and plenty of salt, the animals are scarcely ever ill, and never suffer from tuberculosis; they will often give ten times their own weight of milk in a year."

The Kashmir shawls are made of the finest goats' hair. Most of this very soft hair is obtained from the under-fur of goats kept in Tibet, and by the Kirghiz in Central Asia. Only



Photo by E. Landor]

[Eating

BRITISH GOAT

A much-neglected breed in this country. Note the shape of this animal

a small quantity, averaging 3 ozs., is produced yearly by each animal. The wool is purchased by middlemen, and taken to Kashmir for manufacture.

In India the goat reaches perhaps the highest point of domestication. The flocks are in charge of herd-boys, but the animals are so docile that they are regarded with no hostility by the cultivators of corn and cereals. Tame goats are also kept throughout Africa. The valuable ANGORA breed, from which "mohair" is obtained, is now domesticated in South Africa and in Australia. In the former country it is a great commercial success. The animals were obtained with great difficulty, as the Turkish owners did not wish to sell their best-bred goats; but when once established at the Cape, it was found that they proved better producers of mohair than when in their native province of Angora. The "clip" from their descendants steadily improves.

In the Caucasus, both east and west, in the Pyrenees, and on the South Spanish sierras three fine wild goats, with some features not unlike the burhal sheep, are found. They are called TUR by the Caucasian mountaineers. The species found in the East Caucasus differs from that of the west of the range, and both from that of Spain. The EAST CAUCASIAN TUR is a massive, heavy animal, all brown in colour (except on the fronts of the legs, which are blackish), and with horns springing from each side of the skull like half-circles. The males are 38 inches high at the shoulder. The short beard and tail are blackish, and there is no white on the coat. The WEST CAUCASIAN TUR is much lighter in colour than that of the East Caucasus, and the horns point backwards, more like those of the ibex, though set on the skull at a different angle. The SPANISH TUR has the belly and inner sides of the legs white, and a blackish line along the flank, dividing the white from the brown; also a blackish chest, and some grey on the flank.

In the Caucasus the tur are found on the high crags above the snow-line in summer, whence they descend at night to feed on patches of upland grass; but the main home of the tur by day is above the snow-line. The Spanish species modifies its habits according to the ground on which it lives. Mr. E. N. Buxton found it in dense scrub, while on the Andalusian sierras it frequents bare peaks 10,000 feet high. In Spain tur are sometimes seen in flocks of from 100 to 150 each.

THE PERSIAN WILD GOAT

The original of our domesticated goat is thought by some to be the PASANG, or PERSIAN WILD GOAT. It is a fine animal, with large scimitar-shaped horns, curving

backwards, flattened laterally, and with knobs on the front edge at irregular intervals. It is more slender in build than the tur, light brown in general colour, marked with a black line

WILD GOATS

THE TUR



By permission of P. Thomas, Esq.

FEMALE TOGGENBURG GOAT

These goats are milk-goats par excellence; they remain in profit for at least ten months in the year. Each goat produces on an average from 110 to 120 gallons of milk during the year



By permission of P. Thomas, Esq.

STUD TOGGENBURG GOAT

This breed originally came from Switzerland, but is now well known in England. The animals are fine in bone, have a long, thin neck, with two tassel-like appendages

along the nape and back, black tail, white belly, blackish shoulder-stripe, and a black line dividing the hinder part of the flank from the white belly. Formerly found in the islands of South-eastern Europe, it now inhabits parts of the Caucasus, the Armenian Highlands, Mount Ararat, and the Persian mountains as far east as Baluchistan. A smaller race is found in Sind. It lives in herds, sometimes of considerable size, and frequents not only the high ground, but the mountain forests and scrub, where such cover exists. The domesticated goat of Sweden is said to be certainly a descendant of this species.

THE IBEX

Of the IBEX, perhaps the best known of all the wild goats, several species, differing somewhat in size and in the form of their horns, are found in various parts of the Old World. Of these, the ARABIAN IBEX inhabits the mountains of Southern Arabia, Palestine, and Sinai,



By permission of P. Thomas, Esq.

SCHWARTZALS GOAT

A large, long-haired breed, which derives its name from its peculiar colour, the fore part of the body being black and the hinder part white. These goats are good milkers.

Upper Egypt, and perhaps Morocco. The ABYSSINIAN IBEX is found in the high mountains of the country from which it takes its name. The ALPINE IBEX is now extinct in the Swiss Alps and Tyrol, but survives on the Piedmontese side of Monte Rosa. The ASIATIC IBEX is the finest of the group; its horns have been found to measure $54\frac{3}{4}$ inches along the curve. This ibex inhabits the mountain-ranges of Central Asia, from the Altai to the Himalaya, and the Himalaya as far as the source of the Ganges.

The King of Italy is the great preserver of the ALPINE IBEX, and has succeeded where the nobles of the Tyrol have failed. The animals are shot by driving them, the drivers being expert mountaineers. The way in which the ibex come down the passes and over the precipices is simply astonishing. One writer lately saw them springing down perpendicular heights of 40 feet, or descending "chimneys" in the mountain-face by simply cannoning off with their feet from side to side. Young ibex can be tamed with ease, the only drawback to their maintenance being the impossibility of confining them. They will spring on to the roof of

a house, and spend the day there by preference, though allowed the run of all the premises. The kids are generally two in number; they are born in June.

The ibex was long one of the chief objects of the Alpine hunter. The Emperor Maximilian had a preserve of them in the Tyrol mountains near the Aachen Sea; these he shot with a cross-bow when they were driven down the mountains. Sometimes they were forced across the lake. A picture in his private hunting-book shows the Emperor assisting to catch one in a net from a boat. He notes that he once shot an ibex at a distance of 200 yards with a cross-bow, after one of his companions had missed it with a gun, or "fire-tube." When away on an expedition in Holland, he wrote a letter to the wife of one of the most noted ibex-poachers on his domain, promising her a silk dress if she could induce her husband to let the animals alone. In the Himalaya the chief foes of the ibex are the snow-leopard and wild dog.

THE MARKHOR

The very fine Himalayan goat of this name differs from all other wild species. The horns are spiral, like those of the kudu



MALE ALPINE IBEX

The finest wild goat of Europe, formerly common on the Swiss Alps, now only on a limited area on the Italian side

antelope and Wallachian sheep. It may well be called the king of the wild goats. A buck stands as much as 41 inches at the shoulder, and the maximum measurement of the horns is 63 inches, or over 5 feet! It has a long beard and mane, and stands very upright on its feet. Besides the Himalaya, it haunts the mountains on the Afghan frontier. The markhor keep along the line between the forest and snow, some of the most difficult ground in the hills. The horns are a much-prized trophy.

THE TAHR

The TAHR of the Himalaya is a very different-looking animal to the true goats, from which, among other characters, it is distinguished by the form and small size



Photo by S. G. Payne, Aylesbury, by permission of the Hon. Walter R. B. B. B.

YOUNG MALE ALPINE IBEX

The photograph shows the corrugated horns of the male



By permission of P. Thomas, Esq.

NUBIAN GOAT

These goats come from Nubia and Upper Egypt. They are generally hornless and short-haired; the colour varies, being sometimes black, and sometimes tan and spotted.

to India for that object. A smaller kind is found in the mountains of Eastern Arabia, where very few, even sportsmen, have yet attempted to shoot them.

THE NILGIRI TAHR, OR NILGIRI IBEX

Though not an ibex, the sportsmen of India early gave this name to the tahr of the Nilgiri and Anamalai Hills. The Himalayan species is covered with long, shaggy hair; the South Indian has short, smooth brown hair.

"The ibex," says Hawkeye, the Indian sportsman, of this animal, "is massively formed, with short legs, remarkably strong fetlocks, and a heavy carcass, short and well ribbed up, combining strength and agility wonderful to behold. Its habits are gregarious, and the does are seldom met with separate from the flock or herd, though males often are. The latter assume, as they grow old, a distinctive appearance. The hair on the back becomes lighter, almost white in some cases, causing a kind of saddle to appear; and from that time they become known to the shikaries as the saddle-backs of the herd, an object of ambition to the eyes of the true sportsman. It is a pleasant sight to watch a herd of ibex feeding undisturbed, the kids frisking here and there on pinnacles or ledges of rock and beetling cliffs where there seems scarcely safe hold for anything much larger than a grasshopper, the old mother looking calmly on. Then again, see the caution observed in taking up their resting or abiding-places for the day, where they may be warmed by the sun, listening to the war of many waters, chewing the cud of contentment, and giving themselves up to the full enjoyment of their nomadic life and its romantic haunts. Usually, before reposing, one of their number, generally an old doe, may be observed gazing intently below, apparently scanning every spot in the range of her vision, sometimes for half an hour or more, before she is satisfied that all is well, but, strange to say, seldom or never looking up to the rocks above. Then, being satisfied on the one side, she follows the same process on the other, and eventually lies down calmly, contented with the precautions she has taken. Should the sentinel be joined by another, or her kid come and lie by her, they always lie back to back, in such a manner as to keep a good look-out to either side. A solitary male goes through all this by himself, and wonderfully careful he is; but when with the herd he reposes in security, leaving it to the female to take precautions for their joint safety."

of the horns. The horns, which are black, spring in a high backward arch, but the creature has no beard. A buck stands sometimes as much as 38 inches high at the shoulder. It has a long, rough coat, mainly dark stone colour in tint.

Tahr live in the forest districts of the Middle Himalaya, where they are found on very high and difficult ground. General Donald Macintyre shot one standing on the brink of an almost sheer precipice. Down this it fell, and the distance in sheer depth was such that it was difficult to see the body even with glasses. The tahr is fairly common all along the higher Himalayan Range. Its bones are believed to be a sovereign cure for rheumatism, and are exported



Photo by Fratelli Alinari]

[Florence

ITALIAN GOAT

From the earliest Roman days these goats have been the main form of livestock kept by the mountaineers of the Apennines



Photo by Miss E. J. Beck

ROCKY MOUNTAIN GOAT

This is one of the few animals which are white at all seasons of the year. The horns and hoofs are jet-black, forming a striking contrast to the beautiful coat

dog, and perhaps the guinea-pig, every domesticated animal in use from Cape Horn to the Arctic Ocean has been imported. The last of these importations is the reindeer, which, though the native species abounds in the Canadian woods, was obtained from Lapland and Eastern Asia.

The history of this effort at acclimatisation is curious, and may be quoted in this connection. When the first rush to Klondike was made, the miners were imprisoned and inaccessible during the late winter. The coming of spring was the earliest period at which communication could be expected to be restored, and even then the problem of feeding the transport animals was a difficult one. The United States Government decided to try to open up a road from Alaska by means of sledges drawn by reindeer, and the Canadian Government devised a similar scheme. Agents were sent to Lapland and to the tribes on the western side of Bering Sea, and deer, drivers, and harness obtained from both. The deer were not used for the Klondike relief expeditions by the Americans; but the animals and their drivers were kept in Alaska, native reindeer were caught, and the latest news of the experiment is that the deer were found very useful for carrying the mails in winter.

ROCKY MOUNTAIN GOAT

America possesses only one species of wild goat, the place of this genus being taken in the southern part of the continent by the camel-like guanacos. The ROCKY MOUNTAIN GOAT, the North American representative of the group, is a somewhat anomalous creature. It has very few of the characteristics of the European and Asiatic species. In place of being active in body and vivacious in temperament, it is a quiet, lethargic creature, able, it is true, to scale the high mountains of the North-west and to live among the snows, but with none of the energetic habits of the ibex or the tahr. In form it is heavy and badly built. It is heavy in front and weak behind, like a bison. The eye is small, the head large, and the shoulders humped. It feeds usually on very high ground; but hunters who take the trouble to ascend to these altitudes find little difficulty in killing as many wild goats as they wish. These goats are most numerous in the ranges of British Columbia, where they are found in small flocks of from three or four to twenty. Several may be killed before the herd is thoroughly alarmed, possibly because at the high altitudes at which they are found man has seldom disturbed them. None of the domesticated sheep or goats of the New World are indigenous to the continent of America. It is a curious fact, well worth studying from the point of view of the history of man, that, with the exception of the llama, the



Photo by Miss E. J. Beck

HIMALAYAN TAHR AND YOUNG

The typical representative of the short-horned wild goats

CHAPTER XV

THE ANTELOPES

BY F. C. SELOUS

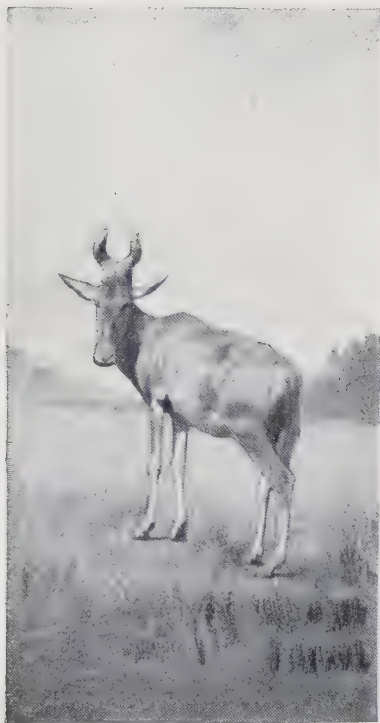


Photo by Miss E. J. Beck

BUBALINE HARTEBEEST

A small species, found in Syria as well as in North Africa

THE TRUE ANTELOPES (including the Gazelles) are strictly confined to the Old World, the Prongbuck of North America differing so much from all other living ruminants, in its horn growth and other particulars, that it is considered to be the sole representative of a distinct family.

THE HARTEBEESTS

With the exception of one species — the Bubal — which is found both in North Africa and Arabia, the HARTEBEESTS are entirely confined to the African Continent. They are animals of large size, standing from 43 to 48 inches at the shoulder, and are characterised by their long, narrow faces, high withers, and doubly curved horns, which are present in both sexes. Nine different species of this group are known to exist.

Although the ranges of these various species of hartebeest cover the greater part of the African Continent, it is noteworthy that each species keeps to its own ground, their several ranges but rarely overlapping.

All the hartebeests have a strong family resemblance, and are very similar in their habits. They are never found either in dense forests or in swampy or mountainous country, but are inhabitants of the arid deserts of Northern and South-western Africa, and of the open grassy plains and thinly forested regions of the high plateaux of the interior of that continent. They are extraordinarily fleet and enduring, and in my own experience I have never heard of one of these animals, of whatever species, having been overtaken or

ridden to a standstill by a man on horseback. They are very inquisitive, and where they have not been molested will allow any unaccustomed object — such as a European in clothes — to walk to within easy shot of them before running off. They soon gain experience, however; and in countries where they have been most persecuted hartebeests are the keenest-sighted and the most wary of all African game. They are very fond of climbing to the top of the large ant-heaps with which the plains of Africa are profusely studded, and from this point of vantage surveying the surrounding country. They live, I believe, entirely upon grass, and in the desert areas of their range seem able to subsist for long periods without drinking water. Their meat I have always thought very palatable. They are generally in fairly good condition, though they seldom carry much fat. Their fat, after being melted, becomes solid again immediately on cooling, and clogs on the teeth whilst being eaten. But very few African species, except the eland, ever become really fat; their life is too active, and the food-supply too uncertain, for them to put on flesh like European deer.



Photo by Percy Ashenden]

[Cape Town

BLESBOK

A species formerly very numerous in South Africa, but now well-nigh exterminated

of the south-western portions of the country — which is still continuing — or several years of continuous drought, caused the withdrawal of the species northwards from the waterless parts of the country. Those, however, which had reached the neighbourhood of Cape Agulhas, where there is plenty of water, would have remained behind and formed an isolated race, which, being influenced by local conditions, would naturally in course of time have become differentiated from the parent stock. Be this as it may, the bontebok of to-day is nothing but a glorified blesbok, being slightly larger and more richly coloured than the latter animal. Its horns, too, are always black, whilst those of the blesbok are of a greenish hue. When they are in good condition, the coats of both these species of antelope, as well as of the SASSABY, another member of this group, show a beautiful satiny sheen, which plays over their purple-brown hides like shadows on sunlit water.

The few bonteboks which still survive are now all preserved on large enclosed farms; but their numbers are very small — less than 300, it is believed. The farmers of Dutch descent now do their best to preserve rare species on their land.

BONTEBOK AND BLESBOK GROUP

Nearly allied to the hartebeests are certain other antelopes of which it will be sufficient to mention but two species — *viz.* the BONTEBOK and the BLESBOK. These two antelopes, though doubtless distinct, since their points of difference are constant and unvarying, are nevertheless so much alike, and evidently so closely allied, that I look upon the former as a highly coloured and specialised race of the latter. The blesbok once had a far wider range than the bontebok, and ran in countless herds on the plains of the northern districts of the Cape Colony, the Orange River Colony, the Transvaal, Griqualand West, and British Bechuanaland, whilst the latter animal has always been confined to the sandy wastes in the neighbourhood of Cape Agulhas, the extreme southern point of Africa.

I think it, however, not improbable that ages ago the blesbok ranged right through Cape Colony to the sea-shore, and that subsequently the gradual desiccation



Photo by J. W. McLellan]

[Highbury

WHITE-TAILED GNU AND CALF

This "Wilbeest" is believed to be practically exterminated as a wild animal



A COW BRINDLED GNU

This gnu, which is still found in great numbers in East Central Africa, indulges in the same curious antics as the white-tailed species

THE GNUS

These remarkable animals were once distributed throughout the greater part of Africa from the Cape to Abyssinia, and their range is even now very extensive, though what was once the most numerous and the most eccentric-looking species of the group has almost ceased to exist.

The gnus are of large size, and at first sight appear to have the head of a buffalo, the tail of a horse, and the limbs and hoofs of an antelope. Their heads are very massive, with broad muzzles and widely separated, hairy nostrils; their necks are maned, tails long and bushy, and both sexes carry horns. They are known as "wilde beeste," or "wild cattle," to the Dutch colonists of South Africa.

The WHITE-TAILED GNU, or BLACK WILDEBEEST, as it is more commonly called, was once found in great numbers on the karroos of Northern Cape Colony, and throughout the vast plains of the Orange River Colony, Transvaal, Griqualand West, and British Bechuanaland. Its range, in fact, was coequal with that of the blesbok. Even as lately as in 1875 and 1876 I personally saw very considerable herds of these quaint animals in the Orange River Colony and the Western Transvaal. When the present war broke out in 1899, there were only two herds of black wildebeest left alive. These animals numbered some 500 head altogether, and were protected by Dutch farmers. There



Photo by Miss E. J. Beck

RED-FLANKED DUIKER

The duikers are for the most part diminutive and graceful antelopes, with simple, spike-like horns

are probably very few of them left to-day, and it is scarcely possible that this most interesting animal will long escape complete extinction.

Black wildebeests, before they had been much persecuted, were so inquisitive that, in the words of Gordon Cumming, they would "caper and gambol" round a hunter's waggon or any other unusual object, and sometimes approach to within a couple of hundred yards, when, whisking their long white tails, they would gallop off with loud snorts. They were always, however, very keen-sighted, and soon became extremely wary and almost impossible to approach on foot in the open plains they frequented, whilst their powers of endurance and fleetness of foot were such that they could only be overtaken by a well-mounted hunter. In spite of these advantages, however, the value of their skins, and the ever-increasing number of hunters, armed with long-range rifles, practically brought about the extermination of this species of gnu in a few decades.

The BRINDLED GNU is a larger animal than the last-named species, standing $4\frac{1}{2}$ feet and upwards at the shoulder. This animal once ranged from the Vaal River northwards, throughout Eastern and Central Africa, to the north of Kilimanjaro, where its range overlaps that of a closely allied form, the WHITE-BEARDED GNU, which is only found in certain districts of Eastern Africa. In general habits these two varieties seem to be identical.

In the interior of Southern Africa, both north and south of the Zambesi, I have met with very large numbers of BLUE WILDEBEESTS. They usually run in herds of from ten to twenty individuals, but towards the end of the dry season collect in droves of 200 or 300. They are often found in company with zebras and sassaby antelopes. Their flesh resembles coarse beef, and, to my thinking, is not ill-flavoured.

THE SMALLER BUCKS

In addition to the great number of antelopes of large size which inhabit the African Continent, there are also very many small species, the life history and habits of some of which are as yet but imperfectly known, since they are denizens of dense forests, and feed principally at night.

All these small African antelopes are divided into two sub-families. The first comprises the African DUKERS and the Indian FOUR-HORNED ANTELOPE, and the second the DIK-DIKS, ORIBIS, KLIPSPRINGER, and certain other small bush-antelopes.

The African duikers are distributed throughout Africa south of the Sahara, and are represented by some twenty different species, the largest of which approaches a small donkey in size, whilst the smallest is not much larger than a hare.

The majority of these dainty little antelopes are inhabitants of the dense tangled forests of the coast-belts of Africa, and are therefore but seldom seen by travellers and sportsmen. One species of the group, however, the COMMON DUKER of South Africa, is a very well-known animal. This little antelope inhabits much more open country than most of its congeners, and has an enormous range, extending from Cape Agulhas to Somaliland, whilst



Photo by Miss E. J. Best

KLIPSPRINGER

The "cliff-jumper" is as active in its habits as a chamois, and is found in most of the mountain-ranges of Africa



Photo by G. W. Wilson & Co., Ltd.]

SING-SING WATERBUCK

The sing-sing and its relatives differ from the true waterbuck by the absence of the white elliptical ring on the legs.



Photo by W. P. Dando]

MOUNTAIN REEDBUCK

One of a group of small antelopes still common in any parts of Africa

on certain breeds of domesticated sheep is a curious fact which has not roused as much comment as it deserves.

THE KLIPSPRINGER

Turning to the second sub-family, we may select the KLIPSPRINGER as the most characteristic species to describe. This beautiful little animal, which is often called the African Chamois, is found in suitable localities from the Cape to Abyssinia. In the southern and northern portions of its range the klipspringer is an inhabitant only of rugged mountain-ranges, and ascends to a height of 9,000 or 10,000 feet above sea-level. In the more central regions of its habitat, however, although it always lives amongst rocks, and thoroughly justifies its name of "rock-jumper," it is often found in regions where there are no high mountain-ranges. It used to be very common in Matabililand, both in the Matopo Hills and on the isolated granite kopjes which are so numerous in that country, and usually are not more than 200 or 300 feet in height. In Mashonaland I have found it living amongst granite rocks in the beds of the larger rivers, and actually on the same level as the surrounding country; whereas on Wedza, a great mountain-mass of slate and ironstone, which rises to a height of about 2,000 feet above the surrounding country, and to the top of which I once climbed, I did not see any klipspringers. The hoofs of this little animal are curiously different from those of any other African antelope, being remarkably short and small, with very deep hollows. This adaptation to its requirements enables the klipspringer to obtain a foothold on any small

two very nearly allied forms are found in Senegal and Abyssinia respectively.

In most species of duikers both sexes are horned, but in the case of the common duiker it is very exceptional to find a female with horns, and in all my experience I have only known of three such cases.

The FOUR-HORNED ANTELOPE is the Indian representative of the African duikers, and is found along the foot of the Himalaya from the Punjab to Nepal, and in suitable localities throughout the peninsula of India. It frequents wooded hills, but avoids dense jungle. Like its nearest allies, the duikers, it is solitary in its habits, more than two of these antelopes seldom being seen together. The growth of four horns on the skull of this antelope and



Photo by S. G. Payne, Aylesbury, by permission of the Hon. Walter Rothschild

MALE IMPALA, OR PALLA

The beautifully curved horns of the male palla form some of the most graceful of trophies

projecting piece of rock, and to climb in a series of little jumps up the faces of cliffs which seem almost perpendicular.

In height the klipspringer stands about 1 foot 9 inches at the shoulder. The males alone carry horns, which are straight and ringed at the base, and vary from 3 to 5 inches in length. The coat is of a greenish yellow-brown colour, with the hairs hollow and brittle. These little animals are usually met with singly, or in twos and threes together. When caught young, they become wonderfully tame, and make the most charming pets, being very playful and fond of jumping, with surprising ease and grace, from the floor of a room on to any elevated position, such as a table, mantelpiece, or window-sill.

THE WATERBUCKS

The largest animals in the first of three groups now to be considered are the WATERBUCKS, antelopes of stout and sturdy build, standing from 45 to 50 inches at the shoulder, and covered with long, coarse hair, especially on the neck, in both sexes. The males alone carry horns, which vary from 20 to 36 inches in length, and are strongly ringed in front for three-fourths of their length. They are sublyrate in shape, being first inclined backwards and then forwards at the tips. There are three well-marked species of waterbuck — *viz.* the COMMON WATERBUCK of South Africa, whose range extends from the Limpopo northwards, through Nyasaland to German and British East Africa, and to the Shebeyli River, in Somaliland; the SING-SING of Senegal and Gambia; and the DEFASSA WATERBUCK of Western Abyssinia and the Nile Valley, south to Uganda and British and German East Africa. In habits all species of waterbuck are very similar. They live generally, though not invariably, in herds of from ten to twenty individuals, and in such small herds



Photo by S. G. Payne, Aylesbury, by permission of the Hon. Walter Rothschild

MALE SAIGA ANTELOPES

These antelopes inhabit the East Russian steppes. The thick woolly coat turns nearly white in winter

there is seldom more than one full-grown male present. In the interior of South Africa the waterbuck is often met with amongst steep stony hills and at a distance of more than a mile from the nearest river. Speaking generally, however, this antelope may be said to frequent the near neighbourhood of water, but to prefer dry to swampy ground. When chased by dogs it always makes for water, and will plunge fearlessly into broad, deep rivers, regardless of crocodiles, to which ravenous reptiles it sometimes falls a victim. In South Africa waterbuck vary much in colour even in the same district, some being reddish brown, whilst others are of a very dark grey. The flesh of the waterbuck is coarse, and sometimes rather strongly tasted, and when in good condition the fat is very hard.

The REEDBUCKS are similar in essential characters to the waterbucks, but are of smaller size, and have more bushy tails, and naked spots on the sides of the head beneath the ears.

Of this group the COMMON REEDBUCK of South Africa is the best known. This animal stands 3 feet at the withers, and is of a soft greyish fawn-colour, with a large fluffy tail, which is always thrown up when the animal runs, exposing the white under-surface. The males alone carry horns, which curve backwards and then forwards, and attain a length of from 12 to 16 inches. Reedbucks are met with singly or in twos and threes, and never congregate in herds,

though I have seen as many as eight, belonging probably to three or four families, feeding in close proximity to one another on young green grass.

Another member of the reedbuck group is the ROOI RHEBUCK of South Africa. This latter species, though a much smaller animal, is very similar to the common reedbuck in colour, shape, and general appearance; it is quite distinct in its habits and mode of life, as it lives in small herds of from four or five to fifteen head, amongst rugged stony hills, often far from water.

THE BLACKBUCK OF INDIA

This handsome species is found throughout India wherever there are open cultivated plains. The male stands about 32 inches at the shoulder, and when full grown is of a glossy black colour, with the exception of a chestnut-coloured patch at the back of the neck, and some markings of the same colour about the face. The belly and insides of the limbs are pure white, the line between the black and white being very clearly defined. The whole body and frame are very compact, strong, and beautifully proportioned, and the head is carried high. The males alone in shape, annulated almost to from 18 to 28 inches. Young coloured instead of black. met with in considerable cultivated tracts alternate with much damage to the natives' first execute a series of probefore finally settling down to prisingly fleet, and can seldom greyhounds, although they down without difficulty by are often called, hunting-

The PALLA, which is Eastern Africa from Bechuana- the most graceful of animals. and is never found far from general bright reddish brown, alone carry horns, which are vary from 14 to upwards of finest specimens of the palla southerly and most northerly animals inhabiting the inter- and carrying shorter horns. in herds of from twenty to alarmed, they bound over

with the utmost ease and grace, and appear to get over the ground at a high rate of speed. They are, however, very commonly run down and torn to pieces by wild dogs, which hunt in packs, and are very destructive to African game.

Of far less graceful appearance than the two preceding species is the SAIGA, which, though structurally closely allied to the gazelles, has been placed by naturalists in a genus by itself.

This curious-looking animal, which is chiefly remarkable for its large swollen-looking nose and light-coloured horns, is an inhabitant of the steppes of the South-eastern Europe and Western Asia. In height it stands about 30 inches at the withers, and is of a dull yellowish colour in summer, turning to nearly white in winter. The males alone carry horns, which are sometimes 13 or 14 inches long, and of a peculiar colour which has been likened to pale amber,



Photo by Miss E. J. Beck

ARABIAN GAZELLE

Gazelles are some of the most slenderly built of all antelopes

carry horns, which are spiral the tips, and vary in length bucks and does are fawn- These antelopes are usually herds on open plains in which waste land, and they often do crops. When alarmed, they digious bounds into the air a steady run. They are sur- be overtaken by the fastest can be caught and pulled trained cheetas, or, as they leopards.

found in Southern and land to Kordofan, is one of It is a forest-loving species, water. Both sexes are of a with white bellies. The males very graceful in shape, and 20 inches in length. The are met with in the extreme portions of its range, the mediate districts being smaller Pallas are gregarious, living over one hundred. When bushes or any other obstacles

At the present day the saiga is only found in Europe on the plains between the Don and the Volga, but to the east of the Ural River its range extends over the Kirghiz Steppes and the high plains of all Western Siberia. Living in open country, and having the senses of hearing, sight, and scent all highly developed, the saiga is a difficult animal to approach, and can only be successfully stalked by an expert hunter. In summer it is usually met with in small, scattered bands, which, when driven southwards by snow and cold, are collected into considerable herds in the more southerly portions of its range. In very severe winters whole herds have been known to perish in snow-drifts, and in such inclement seasons large numbers are also killed by the natives. The flesh of the saiga is said to resemble mutton, and is held in much esteem.

THE GAZELLES

We now come to the Gazelles, among which are comprised many of the best known and most beautiful of the small or medium-sized antelopes. In the true gazelles both sexes generally carry horns. Indeed, this rule is universal in those of Africa and Arabia; and there



By permission of Herr Carl Hagenbeck]

[Hamburg]

GOITRED GAZELLES FROM MESOPOTAMIA

These animals are inhabitants of rocky and desert ground. They are often kept tame by the wandering Arabs

are only four species known — all Asiatic — in which the females are hornless: *viz.* the TIBETAN GAZELLE, PREJEVALSKI'S GAZELLE, the MONGOLIAN GAZELLE, and the PERSIAN GAZELLE.

The range of the various species belonging to this large group is very extensive, comprising the whole of Northern and Eastern Africa, Arabia, and Western and Central Asia, as well as Mongolia and India. The gazelles are inhabitants of the open plains and arid desert regions of the Old World, and, although sometimes met with in tracts of country where there is a certain amount of scattered bush or open stunted forest, are never found in any kind of jungle or thick cover.

On the sandy plains of North-western Africa are found the RED-FRONTED GAZELLE of Senegal and Gambia; the little-known MHORR GAZELLE of South-western Morocco; and the DAMA GAZELLE, a species which has been known to naturalists ever since the time of Buffon. A near ally of the last-named animal is the RED-NECKED GAZELLE of Dongola and Senaar. In North-eastern Africa are found the large and handsome SOEMMERRING'S GAZELLE; the ISABELLA GAZELLE, of the coastlands of the Red Sea; HEUGLIN'S GAZELLE; PELZELN'S GAZELLE, of the maritime plains of Northern Somaliland; and SPEKE'S GAZELLE, of the interior of the same country; whilst farther south the group is represented by the large and beautiful GRANT'S



Photo by L. Medland, F.Z.S.]

[North Finchley]

SPEKE'S GAZELLE*Found in the interior of Northern Somaliland*

Of the whole genus GRANT'S GAZELLE is the most beautiful. This handsome animal, which was first discovered by the explorers Speke and Grant in 1860, is an inhabitant of Eastern Africa, from the neighbourhood of Lake Rudolph southwards to Ugogo. In size the average height at the shoulder of males of this species is about 34 inches. The coat is close and short and of a general fawn colour, the rump and belly pure white, and the face marked with a rufous band from the horns to the nose and with streaks of white on each side. The upper surface of the tail is white, with a black and tufted tip. The horns, which are very elegant in shape, being first curved slightly forwards and then backwards, are much longer and more powerful than in any other gazelle, and attain a length of 30 inches in the males and 17 inches in the females.

Grant's gazelles, though they undoubtedly find their most congenial home in open country, have also been met with by recent travellers in bush-sprinkled wastes and stony, rugged hills. They are, however, never found in dense jungles or high mountains. They live in herds of from half a dozen to twenty or thirty individuals, though in certain localities as many as 200 have been seen together. They are fond of consorting with other game, such as Burchell's and Grevy's zebras, Coke's hartebeest, and the beisa oryx, and are often met with at long distances from the nearest water. They are keen-sighted and wary, and from the open character of the country in which they are usually encountered are often difficult to stalk. When in good condition, the meat of this gazelle is said to be excellent.

The nearest ally of the true gazelles is undoubtedly the SPRINGBUCK of South Africa. Owing to the protection which it has received of late years, this graceful antelope is now a common animal in many parts of South Africa, and in the north-western portions of the Cape Colony still sometimes collects into prodigious herds, which travel through the country in dense masses, destroying every vestige of grass on the

GAZELLE, with its allies PETERS'S GAZELLE and THOMSON'S GAZELLE. The well-known DORCAS GAZELLE is an inhabitant of Morocco and Algeria, ranging through Egypt into Palestine and Syria; the MARICA GAZELLE, the MUSCAT GAZELLE, and the ARABIAN GAZELLE inhabit the deserts of Arabia; the EDMI GAZELLE is found in the mountain-ranges of Morocco, Algeria, and Tunis; while LODER'S GAZELLE inhabits the sandy tracts of the interior of Algeria and Tunis. In Asia, besides the four species of gazelle already enumerated in which the females are hornless, one other member of the group is met with. This is the INDIAN GAZELLE, a species very closely allied to the Arabian form.

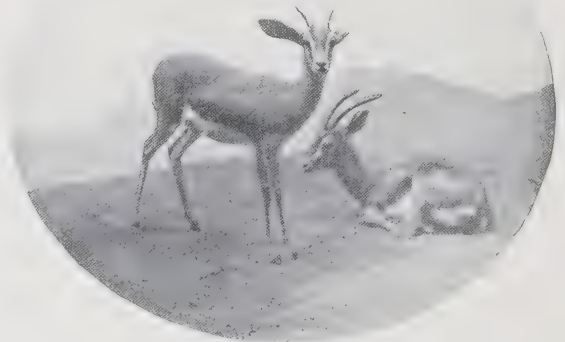


Photo by W. P. Dando]

GAZELLES FROM EGYPT*Seen in great numbers in the Bayuda Desert*

line of their advance, and causing considerable anxiety to farmers, whose flocks of sheep and goats are sometimes swept away by the migrating springbucks. In former years the migration of these antelopes in countless thousands from the deserts of Namaqualand to the countries farther south was a common occurrence, an unerring instinct guiding the wandering herds to districts where rain had lately fallen and caused a new growth of green grass. The animals composing these migrating herds were called by the Dutch settlers of the Cape Colony "Trekboeken," or "travelling-bucks."

Two other antelopes, the DIBATAG and the GERENUK, are included in the present group; but both, whilst typically gazelline in certain respects, differ so much in other ways from all members of that group that each has been placed in a separate genus.

The DIBATAG is a very remarkable-looking antelope, only found in certain districts of Central Somaliland, where it was first discovered by Mr. T. W. H. Clarke in 1890. This species shows the face-markings of the gazelles, whilst the horns, which are only present in the males, much resemble in shape those of a reedbuck. They are rather short, attaining a length of only 11 or 12 inches, and their basal halves are strongly ringed in front. The neck of this antelope is singularly long and thin, and the tail, which is held curved forwards over the back when the animal is in motion, is also much elongated, and only tufted at the tip. The dibatag frequents sandy ground sparsely covered with low thorn-bushes, and lives in small families, being usually met with in twos or threes, whilst it is rare to find more than four or five consorting together.

The GERENUK, like the last-named animal, is an East African species, but has a more extended range, being found all over Somaliland, and thence southwards to the Tana Valley and the Kilimanjaro district of British East Africa. The most remarkable external characteristic of this species is the excessively long neck. The males alone carry horns, which attain an average length of 12 or 13 inches, and, though somewhat gazelle-like in shape, are more strongly crooked forwards at the points. The skull of this species is more dense and solid in structure than in the true gazelles, and the cheek-teeth are smaller in size.

Coming now to the Sable Antelope group, we find an assemblage of antelopes which are all of large size and handsome appearance, and in all of which both the



Photo by W. P. Dando]

[Regent's Park

RED-FRONTED GAZELLE

Inhabits Dongola and Senaar



Photo by W. P. Dando]

[Regent's Park

RED-FRONTED GAZELLE

Another view of the specimen shown above



Photo by Percy Ahrends]

[Cape Town

MALE SPRINGBUCK

Once the most numerous species in South Africa, where it is still not uncommon. Its migrations, or "treks," at certain seasons were one of the sights of the veldt

males and females are horned. With the single exception of the BEATRIX ORYX, which inhabits Arabia, all these antelopes are denizens of Africa. One species of the group, the BLUEBUCK, which appears to have been entirely confined to the mountainous districts of the Cape Peninsula, became extinct during the first decade of the last century. Little is known as to the life history of this animal, but it was undoubtedly nearly allied to the larger and more handsomely marked ROAN ANTELOPE. This latter animal once had a more extensive range than any other antelope, as it was found in almost every part of Africa south of the Sahara, with the exception of the Congo forest region. It has now been exterminated in the more southerly portions of the country, but from the Limpopo to the Upper Nile, and thence to the Niger, it is still to be found wherever the surroundings are suitable to its requirements.

A large bull roan antelope will stand 4 feet 9 inches at the withers. The general colour of the body differs in individuals, even in the same district, varying from a very light shade of brown to dark grey or red-roan. The front and sides of the face are jet-black in the adult male, and dark reddish brown in the female, with two long white tufts of hair under the eyes. The muzzle and extremity of the lower jaw are white. The hair on the under side of the neck is long and coarse, and a stiff mane about 3 inches in length runs from behind the ears to the withers. The ears are very long, and in the females and young males tufted. The horns are curved backwards, and in the male are very stout and strong, attaining

a length of from 26 to 34 inches. In the female the horns are shorter and slighter, and not so strongly ringed.

Roan antelope are usually met with in small herds of from six to a dozen members, and never congregate in large numbers. I do not think I have ever counted as many as thirty together. I have found them fairly common in certain districts, but nowhere very plentiful. They frequent open plains and thinly forested country, and are never found far away from water. Bucks often become savage when wounded, and will sometimes charge viciously if approached incautiously. They can use their horns with great dexterity, and play havoc with a pack of dogs.

The SABLE ANTELOPE, though considerably smaller than the roan, is yet a handsomer animal. In colour the adult male, when in high condition, is jet-black all over with the exception of the white face-markings and the snow-white of the belly and insides of the thighs. The mane is longer and more bushy than in the roan antelope, and often hangs down on either side over the withers. The horns, too, are much finer, and, sweeping backwards in a bold curve, are commonly upwards of 42 inches long, and have been known to reach 50 inches. The striking colour, large size, and horns of this creature make it one of the most-prized trophies of the sportsman. The skin, when prepared and laid down as a rug in halls or dwelling-rooms, is far more handsome than that of any deer. The female of this species is usually of a rich red-brown in colour instead of black as in the male. South of the Zambesi, however, old cows become almost absolutely black. North of the Zambesi both male and female sable antelopes are dark red in colour rather than black. The horns in the female are slighter and less curved than in the male, and are also considerably shorter, as a rule not measuring over 30 inches in length.

The range of the sable antelope extends from the northern districts of the Transvaal to German East Africa. In the country between the Limpopo and the Central Zambesi it used to be a very common animal, especially in the northern districts of Mashonaland. It is partial to open forests intersected by grassy, well-watered glades, and is never found on open plains entirely devoid of bush. It is usually met with in herds of from twelve to twenty individuals, but I have often seen as many as fifty, and once



Photo by S. G. Payne, Aylesbury, by permission of the Hon. Walter Rothschild

SABLE ANTELOPE

A near ally of the Roan Antelope, from which it is broadly distinguished by its striking coloration—black and white



Photo by the Duchess of Bedford]

ROAN ANTELOPE

In common with the Sable Antelope and the Oryx group, both sexes of this species carry horns

had four valuable hounds killed and four others grievously wounded by one of these animals in less than a minute. I once knew a native hunter who was stabbed through the kidneys and killed by a sable antelope cow.

The nearest allies of the sable and roan antelopes are the various species of the genus *Oryx*. In this group are included the WHITE ORYX, which inhabits the desert regions of the interior of Northern Africa from Don-golato Senegal; the BEATRIX ORYX of Southern Arabia; the GEMSBUCK of South-western Africa; the BEISA, which is found in North-east Africa from Suakim southwards to the river Tana; and the TUFTED BEISA, which is

counted between seventy and eighty together. However large a herd of sable antelopes may be, it is very exceptional to find with it more than one fully adult male, from which fact I should judge that these animals are of a very jealous and pugnacious disposition. When wounded and brought to bay by dogs, a sable antelope defends itself with the utmost fury, using its long scimitar-shaped horns with most wonderful quickness and dexterity. If badly wounded it will lie down, otherwise it fights standing. Keeping its face to some of its foes, with a sideways twist of its head it will transfix and throw into the air any dog which attempts to attack it from behind. I have seen a wounded sable antelope, when lying down, drive one of its horns clean through a large dog deep into its own haunch, and I have



Photo by Norman B. Smith, Esq.]

MALE OF GRANT'S GAZELLE

This fine East African species is one of the handsomest of its kind

very nearly related to the last-named species, whose place it takes south of the Tana River in certain districts of British and German East Africa. In general appearance there is a strong family resemblance between the different species of oryx. In all of them both sexes carry horns, which are considerably longer, though somewhat slighter, in the females than in the males. In the white oryx the horns are curved backwards; but in the other four species they are straight, or nearly so. In all the faces are conspicuously banded with black and white, and the tails long, with large dark terminal brushes. The two most desert-loving species, the white and the Beatrix oryx, are paler in general body-colour than the other three, and the latter animal is considerably smaller than any other member of the group, standing not more than 35 inches at the withers. The gemsbuck is the largest and undoubtedly the handsomest of the group, standing 4 feet at the shoulders; the horns of the females are often upwards of 40 inches long, and have been known to attain a length of 48 inches.

In habits all species of oryx seem to be very similar. They are denizens of the arid sun-scorched plains of Africa, which are not necessarily devoid of all kind of vegetation, but are often covered with stunted bush, and carry a plentiful crop of coarse grass after rain. Oryx usually run in herds of from four or five to fifteen or twenty, though the beisa, the most abundant of the group, has been met with in troops numbering 400 or 500 head. All the oryx are shy and wary, and in the open country they usually frequent are difficult to approach on foot. If pursued on horseback, they run at a steady gallop, which they can maintain for long distances, swinging their bushy black tails from side to side, and holding their heads in such a way that their long straight horns are only sloped slightly backwards. Fleet and enduring, however, as oryx undoubtedly are, I am of opinion that in these respects the gemsbuck of South Africa, at any rate, is inferior to all other large antelopes living in the same country, with the single exception of the eland. I have often, when mounted on a fast horse, galloped right up to herds of gemsbuck, and on two occasions have run antelopes of this species to an absolute standstill. Oryx of all species should be approached with caution when badly wounded, as they are liable to make short rushes, and can use their horns with great effect.

Nearly related to the antelopes of the Oryx group in many essential characteristics, yet at once distinguishable by its spiral horns and broad reindeer-like feet, the desert-haunting ADDAX has been placed in a separate genus, of which it is the sole representative.

This remarkable animal stands about 38 inches in height at the withers, and varies in general colour at different seasons of the year, from brownish grey to a reddish hue. The forehead is covered with a thick growth of bushy black hair, beneath which there is a patch of white extending across the nose to under the eyes. The hindquarters, tail, and legs are white. The horns are spiral, and are present in both sexes. In the male they attain



GROUP OF BEISA ORYX

This most interesting photograph, taken by Lord Delamere, shows a group of these fine antelopes on the East African plains



Photo by S. G. Payne, Aylesbury, by permission of the Hon. Walter Rothschild

WHITE ORYX

Found in Northern Africa from Dongola to Senegal

those thirsty regions. It is killed in considerable numbers by the Arabs for the sake of its flesh and hide, and is either stalked or hunted on horseback, with the help of greyhounds, by Europeans.

The last of the sub-families into which modern naturalists have divided the antelopes of the world comprises some of the handsomest species of the whole group, and includes the largest of all antelopes, the Eland, as well as such small and beautifully marked creatures as the Harnessed Bushbucks.

With one exception—the Nilgai—all the members of this sub-family are denizens of the great African Continent.

The NILGAI, or BLUE BULL, is an inhabitant of India, and is found throughout the greater portion of the peninsula, from the base of the Himalaya to the south of Mysore. It is an animal of large size, standing about 4 feet 6 inches at the shoulder. In general colour the male is of a dark iron-grey, the female tawny fawn. White spots on the cheeks and just above the hoofs on the fore and hind feet are the outward signs of its affinity to the African harnessed antelopes. The male alone carries horns, which are nearly straight and very small for the size of the animal, rarely exceeding 9 inches in length.

Passing now to the Harnessed Antelopes of Africa, our attention is first claimed by the BUSHBUCKS. Excluding the Inyala and the Broad-

a length of about 28 inches in a straight line, and about 36 inches following the spiral. In the female they are thinner and less spirally curved. The addax is confined to the desert regions of Northern Africa from Dongola to Senegal, and the broad, rounded hoofs, so unlike those of any other antelope, would seem to show that it inhabits countries where the soil is deep, soft sand.

Very little is known of the life history or habits of this antelope. It is said to associate in pairs or small herds, and to be entirely independent of water, though it travels great distances over the desert in the track of thunder-storms for the sake of the young herbage which grows so quickly wherever rain falls in



Photo by W. P. Dando

[Regent's Park]

BEISA ORYX

The beisa is found in North-east Africa; by some it is believed to have suggested the original idea of the unicorn

horned Antelope, we find several forms of the smaller bushbucks recognised by naturalists: *viz.* the HARNESSED ANTELOPE of the forest regions of Western Africa; the CAPE BUSHBUCK of South Africa; CUMMING'S BUSHBUCK of Eastern Africa; and the DECULA BUSHBUCK of Abyssinia. The various forms of bushbuck vary in general colour from very dark brown to various shades of grey-brown, yellow-brown, and rich red. In all species the young are more or less striped and spotted; but whereas in some forms the adult animals lose their stripes and spots almost entirely, in others the adults are more richly marked than immature specimens. For my part, I am inclined to believe that, if large series of bushbuck-skins were collected from every district throughout Africa, it would be found that all the varieties of this animal at present accepted as distinct species would be found to grade into one another in such a way that only one true species could be recognised.

The bushbucks vary in height at the shoulder from 28 inches to 33 inches, and only the males carry horns, which are nearly straight, with a close spiral twist, and measure in adult animals from 10 inches to 18 inches in length.

Bushbucks are not found in open country, but live in forest or thick bush near the bank of a river, stream, or lake, and are never met with far from water. They are very partial to wooded ravines amongst broken, mountainous country, provided such districts are well watered; and are very solitary in their habits, both males and females being usually found alone, though the latter are often accompanied by a kid or half-grown animal. They are shy and retiring, and should be looked for between daylight and sunrise, or late in the evening, as they are very nocturnal in their habits, and lie concealed in long grass or thick bush during the heat of the day. Their call resembles the bark of a dog, and may often be heard at nights.

The BROAD-HORNED ANTELOPE is only found in the forests of the West African coast range, from Liberia to Gaboon. The male of this species is a very handsome animal, standing about 43 inches at the withers, and is a bright chestnut-red in general colour, with a white spinal stripe extending from the withers to the root of the tail, and fourteen or fifteen white stripes on the shoulders, flanks, and hindquarters. The ears are large and rounded, and the horns very massive, and about 30 inches in length, measured over the single spiral twist. There are two or



Photo by S. G. Payne, Aylesbury, by permission of the Hon. Walter Rothschild

GERENUK

A gazelle-like antelope with long neck and legs, inhabiting North-east Africa



Photo by York & Son]

[Notting Hill

FEMALE NILGAI

The largest of the antelopes of India, and a distant cousin of the Kudu

horns, which are only present in the male, attain a length of about 2 feet in a straight line, and 30 inches along their spiral curve. The standing height at the shoulder of males of this species is about 42 inches.

This most beautiful antelope has a very restricted range, being only found in a narrow belt of coastland extending from St. Lucia Bay to the Sabi River, in South-east Africa, and in a still smaller area in the neighbourhood of the Upper Shiri River, in British Central Africa.

Before the acquisition of firearms by the natives in South-east Africa, the inyala was very plentiful in Northern Zululand and Amatongaland, and was then to be met with in herds of from ten to twenty individuals; whilst the males, which at certain seasons of the year separated from the females, were in the habit of consorting together in bands of from five to eight. Constant persecution by the natives in Amatongaland and the countries farther north very much reduced the numbers of inyalas in those districts a long time ago; but in Zululand, where this animal has been strictly protected by the British authorities for the last twenty years, it was still plentiful up to 1896, when the rinderpest swept over the country, and committed such sad

three large white spots on the cheeks, and a broad white arrow-shaped mark across the nose below the eyes. The female is similar in coloration to the male, but smaller and hornless.

Little or nothing is known as to the habits of this very beautiful antelope. Du Chaillu, who met with it in the interior of Gaboon between 1856 and 1859, says that it is "very shy, swift of foot, and exceedingly graceful in its motions"; but he does not tell us whether it lives in pairs like the bushbucks, or in small herds like some of its other near allies.

The INVALA is another bush-loving antelope closely allied to the bushbucks. In this species the general colour of the adult male is a deep dark grey, that of the female and young male bright yellow-red, and both sexes are beautifully striped with narrow white bands on the body and haunches. In the male long dark hair hangs from the throat, chest, and each side of the belly, and fringes the front of the thigh almost to the hock, and the back of it up to the root of the tail. The ears are large and rounded; and the



Photo by York & Son]

[Notting Hill

ADDAX

Unfortunately, the specimen from which this photograph was taken had lost its splendid spiral horns



